MAY 25, 1957 PAGES 1053 TO 1098

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. XXI OF VOL. I, 1957 LONDON, SATURDAY, MAY 25, 1957 Pp. 104—Price 1s. 6d.
No. 6978 VOL. CCLXXII Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper Annual Subscription: £3 3s.

6 JUN 11 1957
Com. Copy

'ANCOLAN'
TRADE MARK
Tablets containing 25 mg. mecloxine dihydrochloride
THE B.D.H. ANTIHISTAMINIC

IN HAY FEVER *and other allergic conditions and* MOTION SICKNESS
ADVANTAGES long duration of action exceptionally well tolerated
Basic N.H.S. prices: Plastic container of 10 tablets 1/8
Bottles of 25 tablets 3/8
" " 250 " 32/6
Literature and samples will be sent on request
THE BRITISH DRUG HOUSES LTD. (Medical Dept.) LONDON N.1

Second Revised Edition
THE DISEASES OF OCCUPATIONS
By DONALD HUNTER, M.D., F.R.C.P.
Physician, The London Hospital, Director of Department for Research in Industrial Medicine (Medical Research Council).
"A Volume which far outshines in knowledge and in experience anything that has been produced before in this enormous field. It will become the standard work on the subject for a long time to come."—*The British Medical Journal.*
1080 pages £5 5s. net, plus 2s. postage
The English Universities Press Ltd., 102, Newgate-street, London, E.C.1

IN THE MENTAL HOSPITAL
Eleven articles reprinted from THE LANCET.
A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.
72 pages. Price 2s. 6d. (postage 4d.)
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

THE LAW AND ETHICS OF DENTAL PRACTICE
By R. W. DURAND, M.R.C.S., L.R.C.P.
Formerly Secretary of the Medical Protection Society
and
D. MORGAN, L.D.S. (Leeds)
Formerly Deputy Dental Secretary of the British Dental Association
Foreword by Professor R. V. BRADLAW, M.D.S. Dunelm, F.D.S., M.R.C.S. Eng.
Professor of Oral Pathology, Durham University
Director, Newcastle-upon-Tyne Dental School
Expert guidance on the many problems which confront the dentist
Demy 8vo 98 + viii Price 7s. 6d. net, plus 7d. postage
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

TEXTBOOK OF BRITISH SURGERY
Edited by
Sir HENRY SOUTTAR, C.B.E., D.M.(Oxon), F.R.C.S., and Professor J. C. GOLIGHER, Ch.M., F.R.C.S.
VOLUME I: THE ABDOMEN.
552 pages 238 illustrations 3 coloured plates 105s. net
Wm. Heinemann Medical Books Ltd., 99, Gt. Russell St., W.C.1

Third Edition
INTRODUCTION TO
DISEASES OF THE CHEST
By JAMES MAXWELL, M.D. (Lond.), F.R.C.P. (Lond.)
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital.
Demy 8vo 308 + xii 66 Half-tone Illustrations
12s. 6d. net, plus 1s. 4d. postage.
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Sixth Edition *Now available*
PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, C.B.E., D.Sc., Ph.D., F.R.S.
Demy 8vo 314 + x 10s. 6d. net, plus 10d. postage
Revised and enlarged (containing a new chapter on Clinical Trials and 16 pages of random sampling numbers).
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2.

UNITED STATES OF AMERICA AND CANADIAN SELLING RIGHTS HELD BY OXFORD UNIVERSITY PRESS, INC.
114, Fifth Avenue, New York, 11, N.Y., U.S.A.

Dorland's ILLUSTRATED MEDICAL DICTIONARY
(New 23rd Edition)
The familiar red-backed Dorland has served the medical profession faithfully since 1900. This brand new edition has been brought right up to date. It now contains 104,000 definitions—20,000 more than in any other medical dictionary.
1,598 pages. Flexible binding. Thumb-indexed. **87/6d.**

1957 CURRENT THERAPY
The most effective and unified reference source ever devised for placing today's best treatments within your easy reach. The information *is not* extracted from the literature, *is not* experimental, *is not* prejudiced in favour of any special drug or method. The treatment is included solely because it is the *most effective*—old or new makes no difference.
NEW. 731 pages. **77s.**

W. B. SAUNDERS COMPANY LIMITED **7 Grape Street, LONDON, W.C.2.**

PITMAN MEDICAL

Spastics in Cheyne Walk

JOAN ST. GEORGE SAUNDERS & MARJORIE NAPIER

An account of the Centre for Spastic Children, Cheyne Walk, Chelsea. This Centre which started two years ago was founded by voluntary effort but is administered within the N.H.S. It gives therapy, training and education to selected spastics under five. The book gives a full account of the founding and working of the Centre and members of the staff contribute on their own specialities.

To be published 11th June **20s.** *net*

PITMAN MEDICAL PUBLISHING CO. LTD.
45 NEW OXFORD STREET, LONDON, W.C.1.

GENERAL AND CARDIAC SEDATIVE

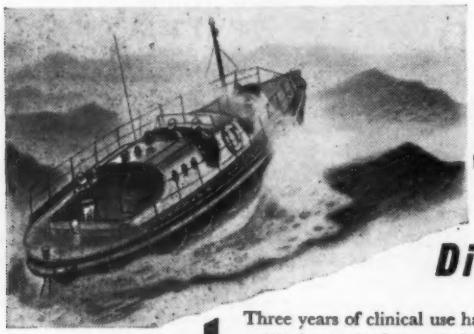
NATISEDINE

Tablets 0.1 gm. Phenylethylbarbiturate of Quinidine
(Bottles of 20 and dispensing packs of 100.)

INDICATIONS

Anxiety states - Insomnia - Nervousness - Distress - Palpitation - Premature beats
Cases resistant to other sedatives.

LABORATORY NATIVELLE Ltd.
74-77 White Lion Street, LONDON, N.1 18-19 Temple Bar, DUBLIN



Distinguished Record

Three years of clinical use have given 'Ilotycin' brand **Erythromycin** a distinguished record of remarkable safety. Highly effective against staphylococci, streptococci and pneumococci, 'Ilotycin' exerts negligible effect on the colon bacillus and does not give rise to the extremely dangerous staphylococcal enterocolitis. It is particularly valuable against penicillin-resistant staphylococci and has become the logical first choice antibiotic after penicillin. 'Ilotycin' is the surest and safest way of combating a wide range of common infections encountered in general and hospital practice, and can be life-saving in overwhelming infections where prompt response is vital.

The average daily dose is 1 Gm., increased in severe infections.

'Ilotycin' is available as Tablets of 100 mg. and 250 mg., and as 'Ilotycin' Paediatric for oral suspension.

Lilly

'ILOTYCIN'

Originated by Lilly

ELI LILLY AND COMPANY LIMITED, BASINGSTOKE, ENGLAND

MAY 25, 1957 PAGES 1053 TO 1098

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6978 LONDON: SATURDAY, MAY 25, 1957 CCLXXII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Leukæmia
RONALD BODLEY SCOTT, F.R.C.P. 1053
The Nature and Origin of the Mammotrophic Agent present in Human Female Urine
Prof. GEOFFREY HADFIELD, F.R.C.P. 1058
Mumps Virus and Subacute Thyroiditis
E. EYLAN, M.D.
R. ZMUCKY
CH. SHEBA, M.D. 1062
Benign Gastric Ulcer
Lt.-Col. E. D. PALMER, M.D. 1064
Asthmatic Wheezing
E. DEKKER, M.D.
J. GROEN, M.D. 1064
A Method of Measuring the pH of Body-fluids
VICTOR WYNN, M.D.
JOHN LUDBROOK, M.B. 1068

MEDICAL SOCIETIES

American Surgical Association .. 1071

NEW INVENTIONS

Kielland's Forceps Handle-lock
J. M. HOLMES, M.R.C.O.G. .. 1074
A Modification of the Tongue-plate of the Boyle-Davis Gag
ANDREW DOUGHTY, F.F.A. R.C.S. 1074

SPECIAL ARTICLES

Metallic Corrosion in Orthopædic Surgery
F. P. BOWDEN, D.SC., F.R.S.
J. B. P. WILLIAMSON, PH.D.
P. G. LAING, F.R.C.S. 1081
Professionalism and Bureaucracy 1081
Regional Hospital Boards and Boards of Governors of Teaching Hospitals 1083
Terminology of Hereditary Hæmoglobinopathies involving Hæmoglobin Variants 1084

REVIEWS

Notices of Books 1073

LEADING ARTICLES

THE IMMUNOLOGY OF THYROID DISEASE 1075
TOWARDS SAFER CLOTHING 1076
CUTANEOUS PAIN 1077

ANNOTATIONS

Television and Medicine 1078
Wheezing 1079
Vitamin D and the Parathyroids 1079
The Enzyme Defect in Galactosæmia 1080
Atypical Acid-fast Bacilli 1080

PUBLIC HEALTH

Health in Scotland 1084
Poliomyelitis 1085
Suspected Smallpox 1085
More Dental Decay in Children .. 1085
B.C.G. Vaccination 1085

LETTERS TO THE EDITOR

Steatorrhœa and Hypoparathyroidism (Dr. W. P. U. Jackson) 1086
Senior Registrars and Consultant Appointments (Dr. R. M. Forrester) 1087
Chronic Bronchitis and Smoking (Mr. T. W. Hurst, A.C.I.S.; Dr. W. W. Kay) 1088
The Rh Blood-groups (Dr. A. S. Wiener) 1088
Wilson's Disease (Dr. Gilbert Hall, Dr. F. C. Neale) 1089
Carbutamide in Juvenile Diabetes (Dr. L. Barta) 1090
Fibrositic Pain (Dr. Louis Moss) 1090
Normality of Ageing (Mr. Alan M. Braverman) 1090
Atherosclerosis in the Bantu (Dr. J. D. Woods, Dr. W. Laurie) 1091
Primary Hepatic Carcinoma (Dr. Oscar Kanner) 1091
Rupture of the Pregnant Uterus (Mr. Edward Cope, M.R.C.O.G.) 1091
Anæsthesia for Fractures of the Femoral Neck (Dr. J. Shegog Ruddell) 1092
Relatives in Hospital (Dr. J. K. Cameron) 1092
L-Noradrenaline Therapy in Acute Renal Failure (Dr. J. de Swiet) 1092
Cortisone and Immunity in Tuberculosis (Dr. Roy Goulding) 1093
Cæsarean Section (Dr. K. D. Salzmann) 1093
Clinical Thermometers (Dr. T. Sussman) 1093
Surgeon's "Privilege" (Dr. T. G. Reah) 1093
Private Practice Group (Dr. John Etheridge) 1094
Prevention of Bedsores in Patients Nursed at Home (Dr. G. W. Roberts, Mrs. F. M. Williams, S.R.N.) 1094
Release of Histamine in Urticaria Pigmentosa (Dr. Robert P. Warin) 1094

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 1085

MEDICINE AND THE LAW

A Capital Murder 1095
Death after Adder-bite 1095

OBITUARY

Walter Perceval Yetts 1095
Harold Guyon Trimble 1095

NOTES AND NEWS

University Apartheid 1096
Congress in Rumania 1097
British Empire Cancer Campaign's Research Unit in Radiobiology 1097
Guild of Health 1097
B.M.A.'s Scottish Headquarters 1097
University of London 1097
University of Oxford 1098
University of Sheffield 1098
University of Colorado 1098
Diary of the Week 1096
Appointments 1098

New Books from Heinemann

THE CYTOLOGY OF EFFUSIONS
in the Pleural, Pericardial and Peritoneal Cavities
by A. I. SPRIGGS, D.M. (Oxon.), M.R.C.P.

"Dr. Spriggs gives a clear account of his not too complicated technique, which demands nothing not already in the clinical laboratory and uses the standard May-Grunwald-Giemsa blood stain. . . . A useful atlas which should encourage clinical pathologists to take more care with cytological preparations from pathological exudates, and so extract more information from them."—*The Lancet.* 42s. net

BLOOD PRESSURE SOUNDS AND THEIR MEANINGS
by J. E. MALCOLM, F.R.C.S., R.A.F.

This monograph is based on an investigation of the sounds of the aorta and peripheral arteries. The sounds are amplified and electronically recorded. Much new and valuable scientific knowledge has been acquired.

96 pages 45 illustrations 12s. 6d. net

CLEFT LIP AND PALATE
Second Edition
by W. G. HOLDSWORTH, F.R.C.S.

"The chapters on operative repair include much new material and they now present a concise but comprehensive review of almost every surgical possibility. . . . Altogether, this new edition is vastly more informative than its predecessor."—*The Lancet.*

172 pages 148 illustrations 42s. net

William Heinemann · Medical Books · Ltd 99 Great Russell Street London WC1

The years of wasted effort

Part III of a series of articles on the Hospital Service in The Observer, Sunday, May 26th

PUBLIC IGNORANCE is the major barrier to reform of the Hospitals, according to Dr. Goldman, a young Commonwealth doctor who has lived and worked in seven British hospitals over the last five years.

In the third of his articles, in The Observer on May 26th, he criticizes the absurd wastage of a system that trains doctors for consultancy, yet fails to provide sufficient jobs when they are trained.

In any case, more consultants are needed. Too many are already working at too high pressure. 100,000 patients in Britain await operation. Why not appoint more consultants?

Dr. Goldman also questions, in this article, the privacy of the teaching hospitals as training centres for consultants. He suggests that influence and conformity play too great a part in appointments.

If you are not already reading this important series of articles, order your copy of The Observer for Sunday, May 26th.

THE OBSERVER

RECENT ISSUES

New (Fourth) Edition. *Now Available.*

THE PREMATURE BABY
By V. MARY CROSSE, *O.B.E.*, M.D., D.Obst.R.C.O.G., D.P.H.
39 Illustrations. **20s.**

THE ESSENTIALS OF MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS
By R. H. MICKS, M.D., F.R.C.P.I.
New (Seventh) Edition. **28s.**

PRINCIPLES OF EPIDEMIOLOGY
By IAN TAYLOR, M.D., M.R.C.P., D.P.H., and JOHN KNOWELDEN, M.D., D.P.H.
25 Illustrations. **30s.**

RECENT ADVANCES IN ANÆSTHESIA AND ANALGESIA
New (Eighth) Edition. By C. LANGTON HEWER, M.B., B.S., M.R.C.P., F.F.A.R.C.S., and J. ALFRED LEE, M.R.C.S., L.R.C.P., F.F.A.R.C.S.
95 Illustrations. **40s.**

PROGRESS IN CLINICAL OBSTETRICS AND GYNÆCOLOGY
By T. L. T. LEWIS, M.B., F.R.C.S., M.R.C.O.G.
90 Illustrations. **55s.**

MARTIUS' GYNECOLOGICAL OPERATIONS
With Emphasis on Topographic Anatomy
Translated by MILTON McCALL, M.D., and KARL BOLTEN, M.D.
Seventh Edition. 450 Illustrations, mostly in Colour. **145s.**

WHILLIS' ELEMENTARY ANATOMY AND PHYSIOLOGY
By ROGER WARWICK, D.Sc., Ph.D., M.D.
New (Fourth) Edition. 108 Illustrations. **22s. 6d.**

AN INTRODUCTION TO BLOOD GROUP SEROLOGY
By KATHLEEN E. BOORMAN and BARBARA DODD, M.Sc., Ph.D.
30 Illustrations. **40s.**

PROGRESS IN CLINICAL MEDICINE
Edited by RAYMOND DALEY, M.A., M.D., F.R.C.P., and HENRY MILLER, M.D., F.R.C.P., D.P.M.
New (Third) Edition. 36 Illustrations. **40s.**

POCKET BOOKS

BELL'S OBSTETRICS
New (Fourth) Edition.
15 Illustrations. **10s. 6d.**

CLAYTON'S GYNÆCOLOGY
Third Edition.
17 Illustrations. **10s. 6d.**

BEAUMONT'S MEDICINE
Third Edition. **10s. 6d.**

J. & A. CHURCHILL Ltd., 104 GLOUCESTER PLACE, LONDON, W.1

Just published by
The Year Book Publishers Inc., Chicago:

CLINICAL USE OF RADIOISOTOPES

A Manual of Technique

Edited by T. FIELDS, M.S., F.A.C.R. (Assoc.) and L. SEED, M.D.

The Specialty of Nuclear Medicine is firmly established and warrants a manual describing currently accepted clinical procedures. The large number of published five-year reviews in this field justifies an attempt at presentation of preferred techniques by experienced users. In addition, the medical rationale, health physics precautions and government regulations which have been formalized and accepted require inclusion in a technical manual. . . . The editors have purposely selected those procedures which they consider to be most representative of the techniques giving the most accurate results in their experience.

1957 455 pages 71 figs. **72s.**

Distributed in the United Kingdom by
INTERSCIENCE PUBLISHERS, LTD.
88-90 Chancery Lane, London, W.C.2

MAY BOOKS

SPORTS INJURIES
Their Prevention and Treatment
By **DONALD F. FEATHERSTONE**
With a Foreword by **SIR ARTHUR PORRITT, K.C.M.G., K.C.V.O., C.B.E.**
204 *pages, with* 48 *illustrations as* 26 *plates.* **35s.**, *post* 1*s.*

This book will be welcomed by physiotherapists connected in any way with injuries received in sport. As Sir Arthur Porritt says: "Throughout the balance between the physiotherapist and the medical profession is well held and the book as a whole places much valuable substance into what has hitherto been rather a pathetically aching void."

A SYNOPSIS OF SURGICAL ANATOMY
By **ALEXANDER LEE McGREGOR**
8th Edition. 824 *pages, with* 766 *illustrations.* **32s. 6d.**, *post* 1*s.* 2*d.*

Presents in concise form the surgical aspects of anatomical facts of value to the senior student and practitioner; no attempt is made to deal exhaustively with the anatomy of the whole body. The remarkably clear diagrams with which the text is illustrated are invaluable. The "new terminology" is used.

JOHN WRIGHT & SONS LTD., BRISTOL

physical methods in

PHYSIOLOGY

By W. T. Catton, M.Sc., Physiology Department, King's College, Newcastle-upon-Tyne. This new book presents, clearly and concisely, and in an abbreviated form, the wide variety of physical experimental techniques and theoretical treatments which have been applied to physiological investigations. 42/- net.

PITMAN Parker St., Kingsway, London, WC2

For 40 years

"EUPINAL"

has been used successfully in the treatment of ASTHMA and CHRONIC BRONCHITIS and may be prescribed on N.H.S. Form E.C.10

"Eupinal" contains Iodine and Caffeine combined in a most elegant and effective form.
In chronic Bronchitis "Eupinal" softens the tough accumulated mucus in the bronchial tubes and allows it to be more readily expectorated. In Asthma it possesses a more markedly soothing effect, lessening the frequency of attacks and reducing their severity and duration, and relieving breathlessness. "Eupinal" contains no poison and is safe in use.

A PRODUCT OF
Cuxson, Gerrard & Co. Ltd.
OLDBURY BIRMINGHAM
Phone : BROadwell 1355

Now Ready

THE PRINCIPLES AND ART OF

PLASTIC SURGERY

by SIR HAROLD GILLIES, C.B.E., F.R.C.S. and D. RALPH MILLARD, Jr., M.D.

This fascinating and unusual work is the outcome of a lifetime's experience in the practice of plastic surgery. Hundreds of cases are reviewed in detail, procedures are described in all their variety, and innumerable controversial points are debated. These volumes cover the development of plastic surgery during this century, when the greatest advances have been made and the largest number of patients restored, and their value to plastic surgeons cannot be over-estimated.

In Two Volumes **£12 10s.** *net per set* *Carriage and packing 4s. extra*

Pp. 690 + *Index* 2472 *illustrations*, 122 *in colour*

BUTTERWORTHS · 88 KINGSWAY · LONDON · W.C.2
Showroom : 11-12 Bell Yard, Temple Bar, London, W.C.2

STEPS IN A NEW DIRECTION

Sodium retention avoided
Little risk of oedema

No potassium depletion
Replacement unnecessary

Greater potency
Reduced dosage

WHEN **Di-Adreson** (PREDNISONE) or **Di-Adreson-F** (PREDNISOLONE)

is prescribed instead of Cortisone Acetate

Both DI-ADRESON and DI-ADRESON-F are supplied in scored tablets 5 mg. Bottles of 30, 100 and 500.

Full literature available on request.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE, LANCASTER PLACE, LONDON, W.C.2

Phone : TEMple Bar 6785/6/7, 0251/2. Grams : Menformon, Rand, London.

THE SAFEST AND BEST PREPARATION OF OPIUM

Nepenthe contains all the constituents of opium and has been prescribed for over 100 years. It has been found by generations of practitioners to be the best preparation of opium as it does not cause the unpleasant after-effects usually attributed to opiates. It can be given over a considerable period and the effect remains invariably constant.

Packed in 2-oz., 4-oz., 8-oz. and 16-oz. bottles, and for injection in ½-oz. rubber-capped bottles, sterile, ready for use.

NEPENTHE

Regd.

(FERRIS)

FERRIS & CO LTD

BRISTOL

Tel:. 21381 Grams: 'Ferris' Bristol

Malnutrition and the skin

In malnutrition the skin is frequently affected. Thus in pellagra, which is ascribed mainly to nicotinic acid deficiency, dermatitis is one of the classical symptoms. Riboflavin deficiency is also characterized by skin lesions such as cheilosis, angular stomatitis and dermatitis of the nasolabial folds.

Marmite has been found particularly valuable in the treatment of lesions of mucocutaneous junctions due to riboflavin deficiency. Marmite provides 1.5 mg. riboflavin and 16.5 mg. nicotinic acid per ounce, as well as all the other known factors of the vitamin B complex. It is easily administered as it can be incorporated in the diet in a variety of appetising ways.

MARMITE
yeast extract

Literature on request

MARMITE LIMITED, 35 SEETHING LANE, LONDON, E.C.3
5605

Each fl. oz. (28 *ml.*) *contains:*

Green iron and ammonium citrate B.P.C.	312 mg.
Iron and manganese citrate B.P.C.	85 mg.
Potassium glycerophosphate B.P.C.	224 mg.
Sodium glycerophosphate B.P.C.	207 mg.
Vitamin B_1 B.P.	2.67 mg.
Tincture of nux vomica B.P.	0.3 ml.
Caffeine citrate B.P.C.	170 mg.

COLLOTONE

Basic N.H.S. cost 3¼d. per fl. oz. Packings—4, 8 and 80 oz.

Literature sent on request

Winter leaves a legacy . . .

She's absent from work again and literally feeling 'under the weather.' In her case — and in so many others at this time of year — winter has taken its toll of energy reserves and has reduced resistance to infection.

It is now that Collotone does so much to maintain well-being in young and old. An easily assimilated tonic, it contains just those elements the body needs to fight the effect of overwork, fatigue, anxiety. Indeed, a course of Collotone is often the surest way to help run-down patients greet the future with a springy step.

THE CROOKES LABORATORIES LTD
PARK ROYAL LONDON N.W. 10

---

for effective treatment of . . .

chronic bronchitis, pulmonary congestion, asthma, and allied chest conditions.

cardiac failure, angina pectoris, Cheyne-Stokes' breathing, and other heart conditions.

oedema and ascites, renal failure.

ETOPHYLATE ORALLY—PER RECTUM—PARENTERALLY

ETOPHYLATE—soluble, neutral, stable theophylline ethanoate of piperazine—a powerful bronchodilator, cardiac and respiratory stimulant.

Tablets —250 mg. for continuous, oral administration, without nausea or gastric irritation. Bottles of 25, 100 and 500.

Suppositories —500 mg. for prompt, prolonged action in both hospitalised and ambulant patients. Boxes of 12 and 144.

Ampoules —500 mg. in 2 c.c., for intramuscular injections only, painless and without discomfort. Also 500 mg. in 5 c.c. for intravenous *and* intramuscular injections. Boxes of 6 and 50.

ETOPHYLATE is also available with papaverine and phenobarbitone.

ETOPHYLATE is prescribable on the N.H.S. *Samples and details on request.*

RONA LABORATORIES LTD

12–13, MOLYNEUX STREET, LONDON, W.1. Tel.: AMBassador 4437/8

6

ready in a couple of shakes

for prolonged action

It's as simple as that to use Mylipen. Just two or three vigorous shakes of the vial and there you have a free-flowing suspension of procaine penicillin ready for injection. And once it is injected 1 cc. (300,000 units) of Mylipen will maintain a therapeutic level of penicillin for 24 hours in most cases. Thus it provides convenient and effective treatment for any infection for which a prolonged acting penicillin preparation is indicated.

MYLIPEN TRADE MARK

In vials of ten 1 cc. doses

GLAXO

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

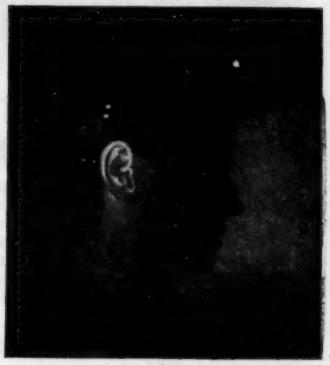
EAR WAX *Removed this easy way*

The removal of wax from the external auditory meatus has, in the past, normally entailed attendance by the patient for diagnosis and for the prescription of a suitable loosening agent, and a second attendance a few days later for syringing.

Now, by the use of Cerumol Ear Drops, wax can be removed in most cases at one visit. A few drops of Cerumol can be instilled into the ear and, while another patient is being attended to, the soft cerumen dissolves and the harder wax disimpacts. The wax can then be removed by gentle syringing or with cotton wool. The wax may even be found to run out of the ear on its own accord, in which case patients themselves may instil Cerumol at home, obviating further attendances.

Cerumol is anti-bacterial, non-irritating and harmless to the lining of the external auditory meatus or the tympanic membrane.

Cerumol is included in Category No. 4 of the M.O.H. classified list of Proprietary Preparations and may be prescribed on N.H.S. Form E.C.10.



PACKS :—For Surgery Use : 10 *c.c. vial—separate dropper included.* Basic *N.H.S. price* 2/8.) *For Hospital Use :* 2 *oz. and* 10 *oz. bottles.*

CERUMOL Reg. Trade Mark

EAR DROPS

for the easier removal of wax

Distributors in U.K.

TAMPAX LIMITED, BELVUE ROAD, NORTHOLT, GREENFORD, MIDDLESEX. Tel. : WAXlow 2244

If you wish to test for yourself and have not received recently a 10 *c.c. vial, please write or telephone direct to :*

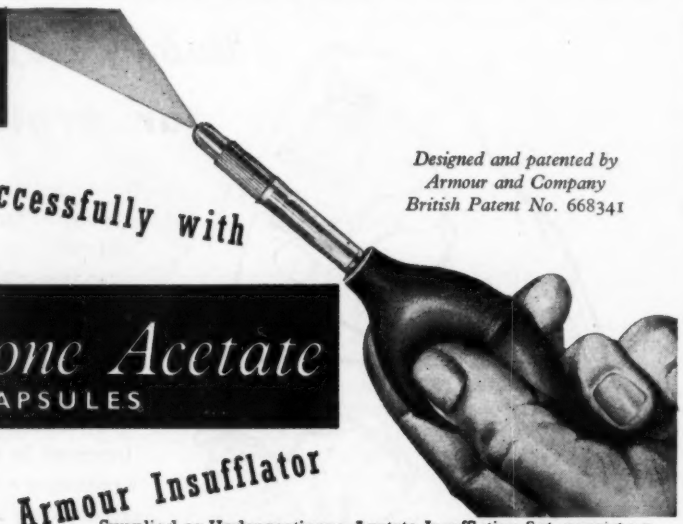
LABORATORIES FOR APPLIED BIOLOGY LTD. · 91, AMHURST PARK · LONDON N.16 · Telephone : STAmford Hill 2252

7

Hay Fever

* treated successfully with

Hydrocortisone Acetate
SNUFF CAPSULES



Designed and patented by Armour and Company British Patent No. 668341

* for use in the Armour Insufflator

Supplied as Hydrocortisone Acetate Insufflation Set, consisting of one Insufflator and 6 capsules each containing 15 mg. Hydrocortisone Acetate Snuff with inert substance. Also refills in bottles containing 6, 12 and 25 capsules.

Reference :
LANCET i (1956) 537

Write for literature and samples

THE ARMOUR LABORATORIES
(Armour and Company Ltd.)
HAMPDEN PARK, EASTBOURNE, ENGLAND
Telephone : Hampden Park 740. *Telegrams : Armolab, Eastbourne.*

AMPHETONE
REGISTERED

A GENERAL STIMULANT FOR THE CENTRAL NERVOUS SYSTEM

For cases requiring a quick-acting general stimulant without increasing the patient's appetite, we consider Amphetone unique. It combines for the first time, Dexamphetamine Sulphate and Strychnine with Glycerophosphates and members of the Vitamin B Group. The Dexamphetamine provides the convalescent with an immediate feeling of well-being, this being followed by the well-known tonic effects of the other medicaments. Clinical reports have been excellent.

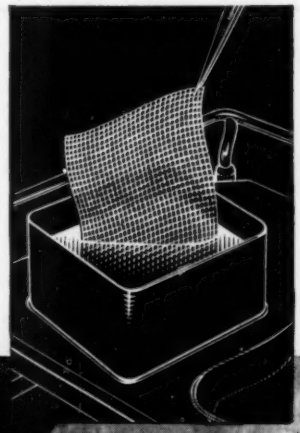
FORMULA
Dexamphetamine Sulphate B.P.C., 1/12 grain : Strychnine Hydrochloride B.P., 1/60 grain : Calcium Glycerophosphate B.P.C., 2 grains : Sodium Glycerophosphate B.P.C., 2 grains : Aneurine Hydrochloride B.P., 1/30 grain : Nicotinamide B.P., 1/4 grain : Riboflavin B.P., 1 60 grain : Syrup of Blackcurrant B.P.C., 2 fluid drms. : Water, to 1/2 fluid ounce.

[POISON] [S4]

Available in bottles containing 10, 20, 40 and 80 fluid ounces. Professional prices 5/3, 9/11, 16/8 and 30/4 each. Samples available on request.

JAMES WOOLLEY, SONS & CO. LTD., VICTORIA BRIDGE, MANCHESTER 3
In association with J. C. Arnfield & Sons, Ltd.
London Stockists : May, Roberts & Co., Ltd., 47, Stamford Hill Road, London, N.16.
Distributors for Northern Ireland : Messrs. Dobbin & Stewart, 47-49, Earl Street, Belfast.

WAI



JELONET

is a dressing of many parts

'Jelonet' sterilized dressings were used in this breast reduction. This emphasises the diverse applications of 'Jelonet', from minor epithelial injuries, grafts, burns, compound fractures, deep granulating wounds to major surgery.

'Jelonet' sterilized dressing, a Smith & Nephew product, is available in tins for immediate use in the hospital operating theatre or in your surgery and is made from specially woven open-mesh gauze, thoroughly and evenly impregnated with soft paraffin containing 1.25 per cent. Balsam of Peru.

Because 'Jelonet' is compatible with all antibiotics and medicaments it may be used in combination with them.

Availability:
For prescription on N.H.S. form E.C.10. Tins of 5, 10 or 36 pieces (non-interleaved). Tins of 36 pieces (interleaved). Single pieces in sealed envelopes (for use in patients' homes). Each piece 3¾" x 3¾" (9.52 cms x 9.52 cms).

For hospital use only
8 yard strips (folded zig-zag) 3¾" wide (7.31 m x 9.52 cms).

JELONET TRADE MARK PARAFFIN GAUZE DRESSING B.P.C.

SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS

an S&N product

Gastric Irritation AND aspirin

"ASPIRIN is a serious gastric irritant, particularly in peptic ulcer patients."

"CALCIUM ASPIRIN ... can be used with impunity, especially if prescribed in soluble form."

British Medical Journal, July 2nd, 1955

SOLPRIN provides calcium aspirin in pure and stable form.

CODIS is a compound tablet that provides codeine and phenacetin, and calcium aspirin which replaces the ordinary aspirin in tab. codein. co. B.P.

Neither SOLPRIN nor CODIS is advertised to the public

RECKITT & COLMAN LTD., HULL & LONDON (PHARMACEUTICAL DEPT., HULL)

Designed for Protection...

An example of Thirteenth Century Armour

Nobecutane
Trade Mark

The sterile spray-on plastic wound dressing. Transparent, impermeable to bacteria but permeable to air and water vapour. Washable but waterproof.

NEW QUALITY now available

The new improved quality retains all the advantages of the original product, but has the **additional advantage of remaining cleaner for longer than any traditional dressing.**

Available in 50 ml. bottles and 100 & 300 ml. sprays.

Further information gladly supplied by the Medical Information Department

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LIMITED
SPEKE, LIVERPOOL 19 · (HUNTS CROSS 1881)
London Office: Ruislip, Middlesex (Ruislip 3333)

1004

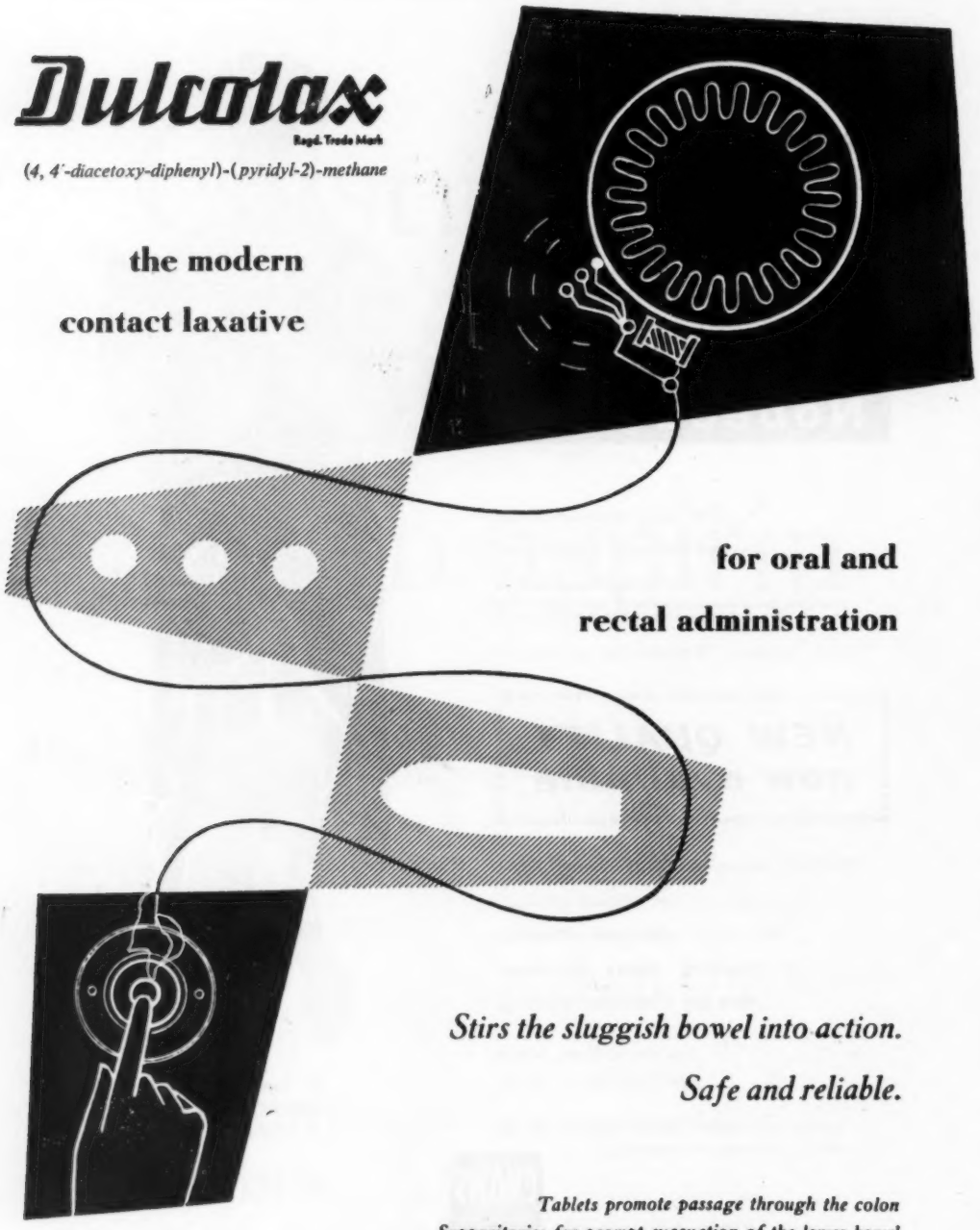
Dulcolax

Regd. Trade Mark

(4, 4'-diacetoxy-diphenyl)-(pyridyl-2)-methane

the modern

contact laxative



for oral and

rectal administration

Stirs the sluggish bowel into action.

Safe and reliable.

Tablets promote passage through the colon
Suppositories for prompt evacuation of the lower bowel

Dulcolax enteric coated tablets of 0.005 g. · Bottles of 30 and 200
Dulcolax suppositories of 0.01 g. · Boxes of 6 and 50

LEWIS LABORATORIES LTD., LEEDS 9

Facts his doctor wasn't told...

Retired for the last three years, the patient complains that he's unable to keep pace with his gentle present-day routine. 'Says he's always tired . . . can't understand it as he's always been so active for his age. He doesn't say however that since his wife died, he's lost interest in his food . . . his attention to diet has been lacking and regular meals have been replaced by casual snacks.

GEVRAL Geriatric Vitamin—Mineral Supplement was evolved to enable doctors to treat just such patients—to provide a balanced ration of essential nutrients in the simplest form. The usual dosage is one capsule daily—and the GEVRAL formula is so comprehensive that this routine provides effective all-round supplementation. Indeed, for many elderly patients the result is a gratifying return of general well-being—and the rediscovery that life *is* worth living!

GEVRAL*

Capsules

Geriatric Vitamin—Mineral Supplement

Each capsule contains:

Vitamin A	5,000 I.U.	Ascorbic Acid (C)	50 mg.
Vitamin D (viosterol)	500 I.U.	(Purified intrinsic factor concentrate 0.5 mg.)	
Vitamin B_{12} as present in concentrated extractives from streptomyces fermentation	1 microgram.	Rutin	25 mg.
		Iron (as $FeSO_4$)	10 mg.
Thiamine mononitrate (B_1)	5 mg.	Iodine (as KI)	0.5 mg.
Riboflavine (B_2)	5 mg.	Calcium (as $CaHPO_4$)	145mg.
Niacinamide	15 mg.	Phosphorus (as $CaHPO_4$)	110 mg.
Folic Acid	1 mg.	Boron ($as Na_2B_4O_7.10H_2O$)	0.1 mg.
Pyridoxine HCl (B_6)	0.5 mg.	Copper (as CuO)	1 mg.
Calcium pantothenate	5 mg.	Fluorine (as CaF_2)	0.1mg.
Choline dihydrogen citrate	100 mg.	Manganese (as MnO_2)	1 mg.
Inositol	50 mg.	Magnesium (as MgO)	1 mg.
Vitamin E	10 Units	Potassium (as K_2SO_4)	5 mg.
		Zinc (as ZnO)	0.5 mg.

another member of the

LEDERLE VITAMIN RANGE

*REGD. TRADEMARK

LEDERLE LABORATORIES DIVISION *Cyanamid* OF GREAT BRITAIN LTD., London, W.C.2 Lederle

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed.* Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins.

It is now being widely prescribed, with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

* *Therapeutische Umschau VIII*, 1952, 10, 143

Transvasin is available in 1 oz. tubes, basic N.H.S. price in the U.K. 2/6 plus P.T. and is not advertised to the public. It may be prescribed on Form E.C.10. Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD., 11 Waterloo Place, London, S.W.1 WHItehall 8654/5/6

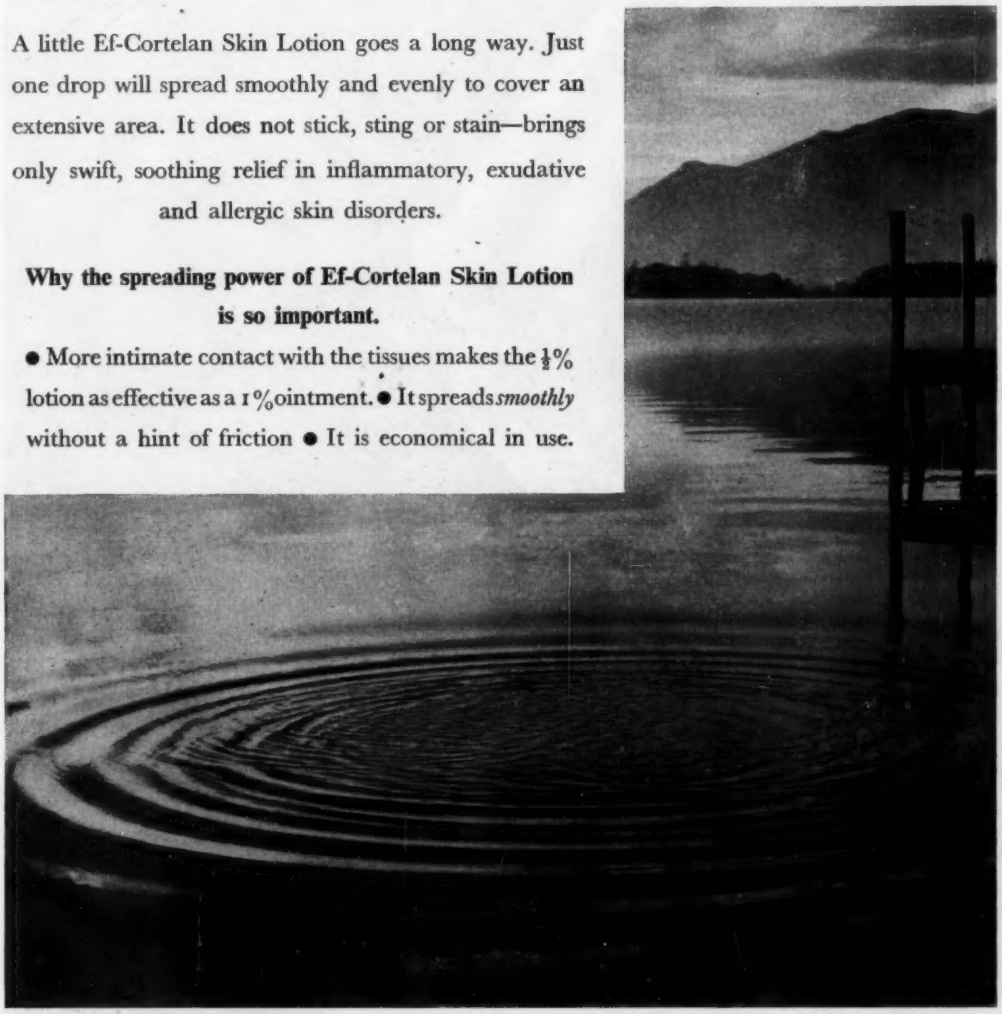
Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

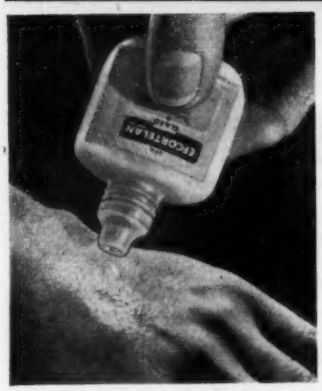
Spreading smooth and even . . .

A little Ef-Cortelan Skin Lotion goes a long way. Just one drop will spread smoothly and evenly to cover an extensive area. It does not stick, sting or stain—brings only swift, soothing relief in inflammatory, exudative and allergic skin disorders.

Why the spreading power of Ef-Cortelan Skin Lotion is so important.

● More intimate contact with the tissues makes the ½% lotion as effective as a 1% ointment. ● It spreads *smoothly* without a hint of friction ● It is economical in use.





GLAXO

EF-CORTELAN

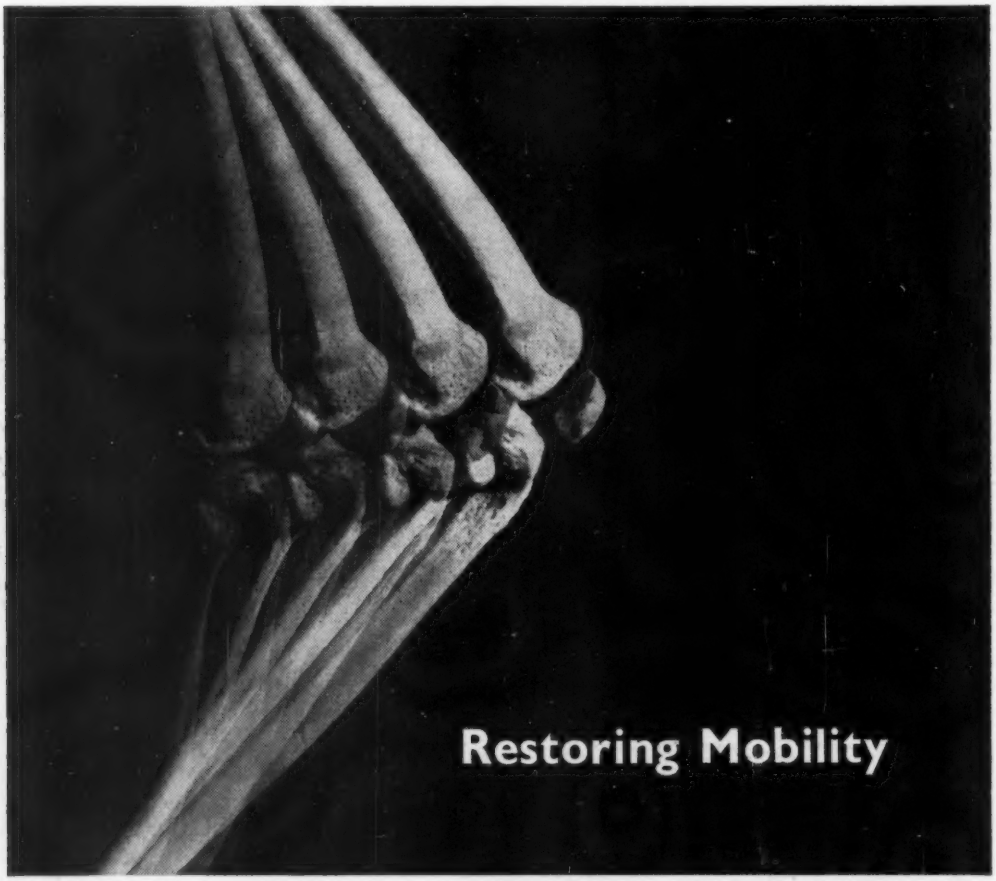
SKIN LOTION

(0.5% and 1% hydrocortisone alcohol in non-greasy fluid *base) In 20 cc. squeeze bottles.*

ALSO [AVAILABLE :| EF-CORTELAN SKIN OINTMENTS
and
OINTMENT and LOTION WITH NEOMYCIN.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX, ENGLAND.
Subsidiary Companies and Agents in most countries

*x 15



in severe rheumatoid arthritis

Deltacortril*

brand of prednisolone

"... more effective than any previous drug in the control of the signs and symptoms of rheumatoid arthritis." *Lancet* (1955) **ii**, 1393

Tablets containing 5 mg. prednisolone in bottles of 10, 20, 100, 500, and 1,000. Tablets containing 1 mg. prednisolone in bottles of 100.

in less severe rheumatoid arthritis

Deltalgycortril*

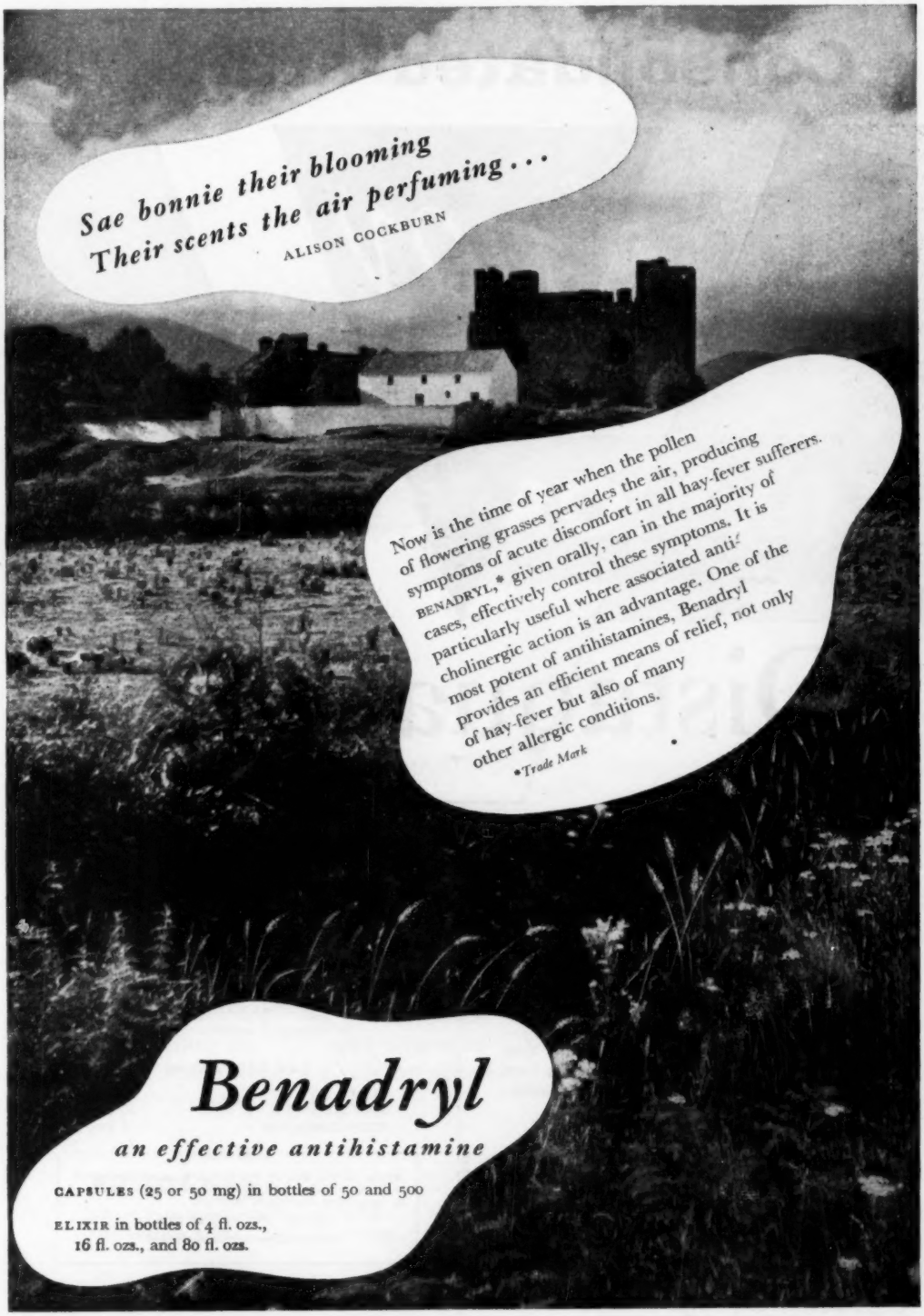
prednisolone and acetylsalicylic acid

"Four hundred cases of various types of arthritis were treated ... with notable improvement and with a minimum of side effects." *Ohio State Med. J.* (1956) **52**, 722

Each tablet contains 0.5 mg. prednisolone and 5 grains acetylsalicylic acid. Available in bottles of 100.

Pfizer PFIZER LTD · FOLKESTONE · KENT

* *Trade Mark of Chas. Pfizer & Co., Inc.*

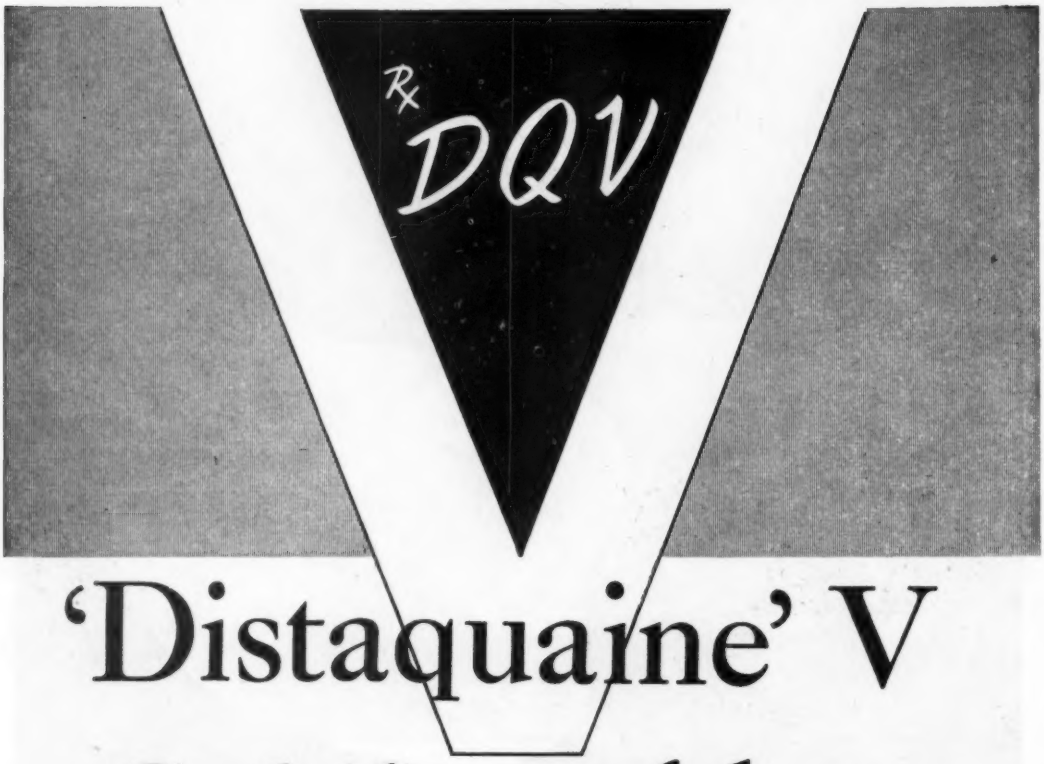

Sae bonnie their blooming
Their scents the air perfuming . . .
ALISON COCKBURN
Now is the time of year when the pollen of flowering grasses pervades the air, producing symptoms of acute discomfort in all hay-fever sufferers. BENADRYL,* given orally, can in the majority of cases, effectively control these symptoms. It is particularly useful where associated anti- cholinergic action is an advantage. One of the most potent of antihistamines, Benadryl provides an efficient means of relief, not only of hay-fever but also of many other allergic conditions.
*Trade Mark
Benadryl
an effective antihistamine
CAPSULES (25 or 50 mg) in bottles of 50 and 500
ELIXIR in bottles of 4 fl. ozs., 16 fl. ozs., and 80 fl. ozs.

PARKE, DAVIS & CO. LTD., *(Inc. U.S.A.)* HOUNSLOW · MIDDLESEX. *Telephone: Hounslow 2361*

489

17

Consolidated attack...



'Distaquaine' V Sulpha tablets

'DISTAQUAINE' V SULPHA offers a new and reliable form of penicillin/sulphonamide therapy convenient to both practitioner and patient.

This balanced combination of two rapidly and efficiently absorbed sulphonamides with acid-stable 'Distaquaine' V provides, for the first time, the effectiveness of treatment with sulphonamides and penicillin in a single oral preparation.

DC&BL

THE DISTILLERS COMPANY (*Biochemicals*) LIMITED

Broadway House, The Broadway, Wimbledon, London, S.W.19
Tel: Liberty 6600

Owners of the trade mark 'Distaquaine'

'DISTAQUAINE' V
for reliable penicillin levels
SULPHADIMIDINE AND SULPHAMERAZINE
for enhanced antibacterial effect

Each tablet contains:

PENICILLIN V	60 mg.
SULPHADIMIDINE	0.30 gm.
SULPHAMERAZINE	0.14 gm.

DOSAGE

Adults: Initial dose of two tablets followed by one or, in specially serious cases, two tablets six times a day at not more than four-hourly intervals.

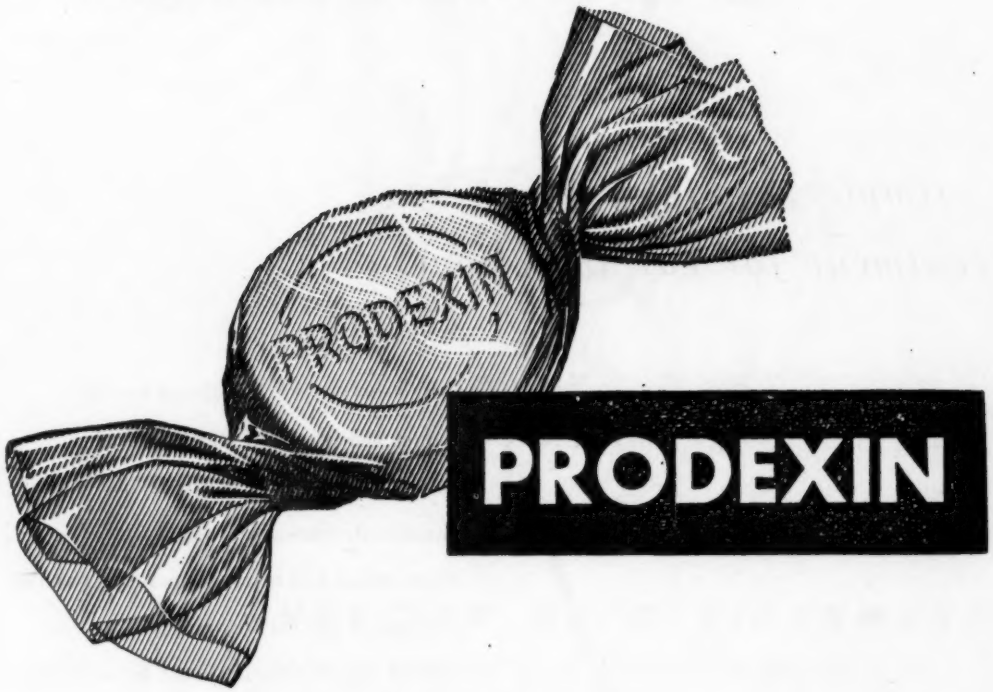
Children: Half the adult dose.

Infants: Quarter the adult dose.

PACKS: Bottles of 30, 200 and 1,000 tablets.

PPH 7/57

PREDICTABLE *ANTACID THERAPY*



1 **rapidly relieves gastric pain**
2 **safely buffers excess acid**
3 **non-alkalising**
4 **non-constipating**
5 **stable, consistent and predictable**

Prodexin tablets provide the advantages of alumina buffer therapy without its disadvantages. The tablets are pleasant to take and when slowly sucked provide antacid control comparable with that obtained by drip therapy. Prodexin, however, does not aggravate acid secretion.

PRODEXIN
Dihydroxy aluminium aminoacetate...0·9 gm.
Magnesium carbonate.....0·1 gm.

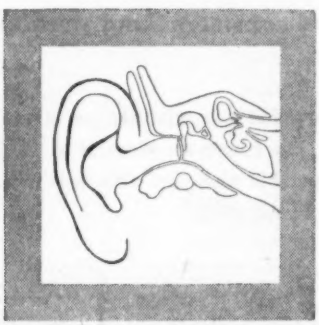
Cartons of 30 singly wrapped tablets.

Dispensing packs of 240 tablets (basic N.H.S. cost 30/4d.)

C. L. BENCARD LTD · PARK ROYAL · LONDON · N.W.10

simpler, swifter, surer
treatment for ear infection

CHLOROMYCETIN* Ear Drops greatly reduce the time and effort necessary to treat suppurative otitis media, chronic otorrhoea, and infections of fenestration and mastoid operation cavities. Treatment can be conveniently carried out, if necessary in the patient's home, and is effective in a matter of days as compared with previous techniques requiring long and tedious application under close supervision.



CHLOROMYCETIN *Trade Mark

EAR DROPS 10%

(Chloromycetin 10% in propylene glycol) in 5 c.c. vials, with dropper, & bottles of 100 c.c.

Parke, Davis
& Company Limited (Inc. U.S.A.)
HOUNSLOW, MIDDLESEX
Telephone Hounslow 2361

382

HAIRY VIOLET

A QUESTION OF ENVIRONMENT

Emotional upsets may have a profound effect on the internal environment of the ulcer patient. He cannot emulate the prairie flower and still thrive for, like the Hairy Violet, whose distribution and vigour is limited by pH, his normal mode of life is painfully interrupted by increased gastric acidity.

With Aludrox, rapid and effective acid control can be achieved. It stabilises the stomach contents at a safe level at which normal digestion can proceed behind the protective gel shield.

ALUDROX *(Aluminium Hydroxide Gel)*

PACKS:
Bottles of 6 and 12 oz.
Tablets in boxes of 30 x 6½ grains, and 60 x 30 grains.

The word 'Aludrox' is the registered trade mark of

Wyeth

John Wyeth and Brother Limited, Clifton House, Euston Road, London, N.W.1

A.2

Further refinements in the chemotherapy of tuberculosis

THERAPAS

(Calcium B-P.A.S.)

and

THERAZID

('Therapas' and isoniazid)

If P.A.S. is indicated, THERAPAS may be used as the drug of choice because it has these significant properties.

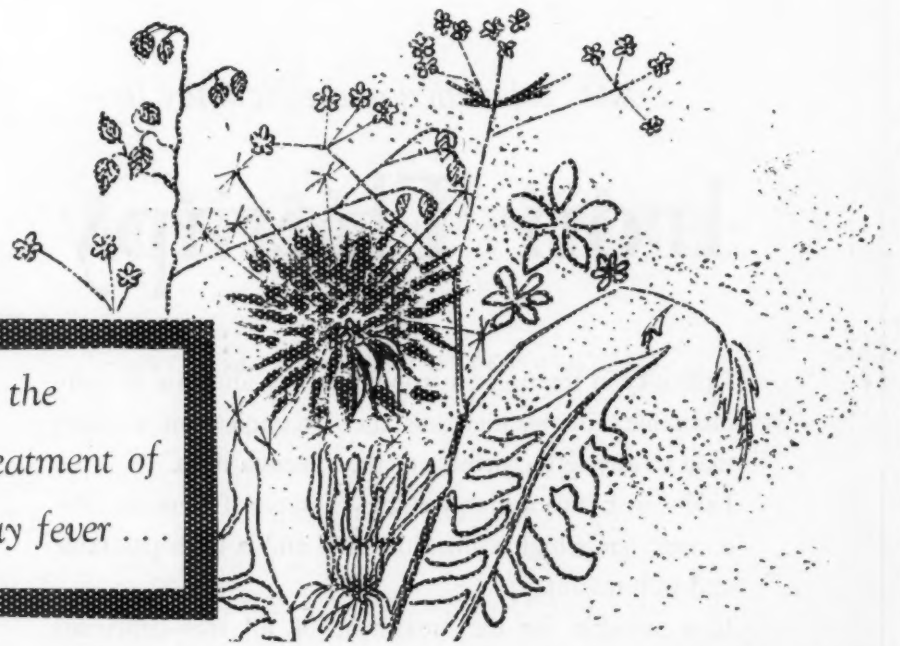
★ No unpleasant taste
★ Overcomes the problems of nausea and vomiting
★ Minimises gastro-intestinal disturbances
★ Breaks down in the body to yield P.A.S.
★ Yields more prolonged blood levels of P.A.S. than an equivalent dosage of P.A.S.
★ Produces high urinary concentrations of P.A.S. and is the drug of choice in the management of genito-urinary tuberculosis.

THERAZID is a convenient and easy to take combination of 'Therapas' and 'Pycazide' (Smith & Nephew's name for isoniazid B.P.) For *domiciliary treatment* THERAZID is particularly valuable. Patients complaining of gastro-intestinal upset and monotony of dosage of P.A.S. and isoniazid therapy will be happier and more co-operative on THERAZID.

S&N products

Further details will gladly be sent on request

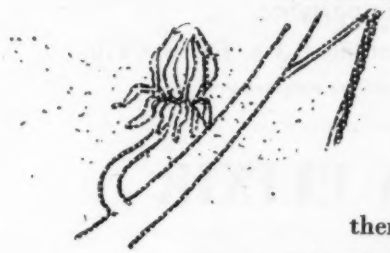
SMITH & NEPHEW PHARMACEUTICALS LTD • WELWYN GARDEN CITY • HERTS



In the treatment of hay fever . . .

SANDOSTEN* NASAL SPRAY

(Thenalidine) *(*Trade Mark)*



Sandosten Nasal Spray contains thenalidine (an antihistamine), calcium and ephedrine. It ensures long-lasting nasal decongestion without the "rebound effect" observed after the use of some vasoconstrictors.

Plastic Nebulizers of 10 ml. **Basic N.H.S. Price : 3/4**

Literature and samples are available on request.

SANDOZ

SANDOZ PRODUCTS LIMITED

134 Wigmore Street, London, W.1.

Taste, tolerance and efficiency in

Iron Therapy

Difficulty in treating an iron-deficiency anaemia is more often due to "consumer-resistance" to unpleasant remedies than to any refractoriness of the anaemia itself.

Ferlucon Elixir, a highly stable solution of Ferrous Gluconate, has a high utilization rate, and is both palatable and well-tolerated.

It is suitable for the treatment of all iron-deficiency anaemias—especially those of childhood and pregnancy, when palatability and absence of unpleasant alimentary disturbances are of particular importance.

Each teaspoonful (3.5 ml.) contains 0.3 g. Ferrous Gluconate-Evans.

FERLUCON ELIXIR

Presentation: Bottles of 4 fl. oz. (114 ml.) and 2 litres.

Ferlucon Tablets containing 0.3 g. Ferrous Gluconate are also available

EVANS MEDICAL SUPPLIES LIMITED

LIVERPOOL LONDON EVANS MEDICAL NEWCASTLE SWANSEA

London Office: Ruislip, Middlesex (Ruislip 3333)

Antistin-Privine

ANTI-ALLERGIC AND DECONGESTANT

IMMEDIATE RELIEF

IN HAY FEVER AND OTHER

ALLERGIC RHINORRHOEAS

Prolonged freedom from symptoms

follows a single application

POCKET NEBULISERS * DROPPER BOTTLES

Antistin-Privine contains 0.5% Antistin (2-phenylbenzylaminomethyl-imidazoline sulphate) and 0.025% Privine (2-naphthylmethyl-imidazoline nitrate)

C I B A

'Antistin' and 'Privine' are registered trade marks. Reg. use

CIBA LABORATORIES LIMITED, HORSHAM, SUSSEX

Telephone : Horsham 4321 Telegrams : Cibalabs, Horsham.

14/5

CHEMOTHERAPY OF TUBERCULOSIS

Calcium B-PAS

WANDER

the newest proven modification of PAS for safe, acceptable, convenient and therapeutically reliable performance in combined regimens with Isoniazid.

B-PAS (Wander), 4-benzoylamino-2-hydroxybenzoate, first introduced by our Research Laboratories in 1948, is an acknowledged contribution to tuberculotherapy.

ADVANTAGES

CALCIUM B-PAS (Wander) is virtually insoluble.
It provides high blood levels of extended duration.
It is practically tasteless.
It is well tolerated and best suited for domiciliary use.

MULTIPLE PRESENTATION FOR COMBINED REGIMENS

CALCIUM B-PAS (Wander) is available as such in two convenient forms: Powder and Cachets. Content in each form is ranged so that the daily regimen is simplified. The 3.5 g. Powders taken with a draught of water or milk are especially acceptable. For combined regimens of B-PAS and INAH, 'B-PASINAH' Powders and Cachets according to preference supply the advantage of concurrent therapy in readily acceptable form which practically ensures the patient's co-operation in carrying out instructions.

PACKINGS

CALCIUM B-PAS WANDER

Powders: Tins of 150 and 500 x 3.5 g. envelopes
Cachets: „ „ 80 and 400 x 1.0 g.
Sodium B-PAS (Wander) also available in 1.5 g. Cachets

'B-PASINAH' (B-PAS plus Isoniazid)

Powders: Calcium B-PAS (Wander) 3.5 g.
Isoniazid ... ... 87.5 mg.
Tins of 150 and 500

Cachets: Calcium B-PAS (Wander) 1 g.
Isoniazid ... ... 25 mg.
Tins of 100 and 500

Full Abstracts from Literature on B-PAS, also details of institutional quantities and prices sent on request.

'PASINAH' Cachets of 1.5 g. Sodium PAS and 17, 25, 33 or 50 mg. Isoniazid also available.
Tins of 100 and 500

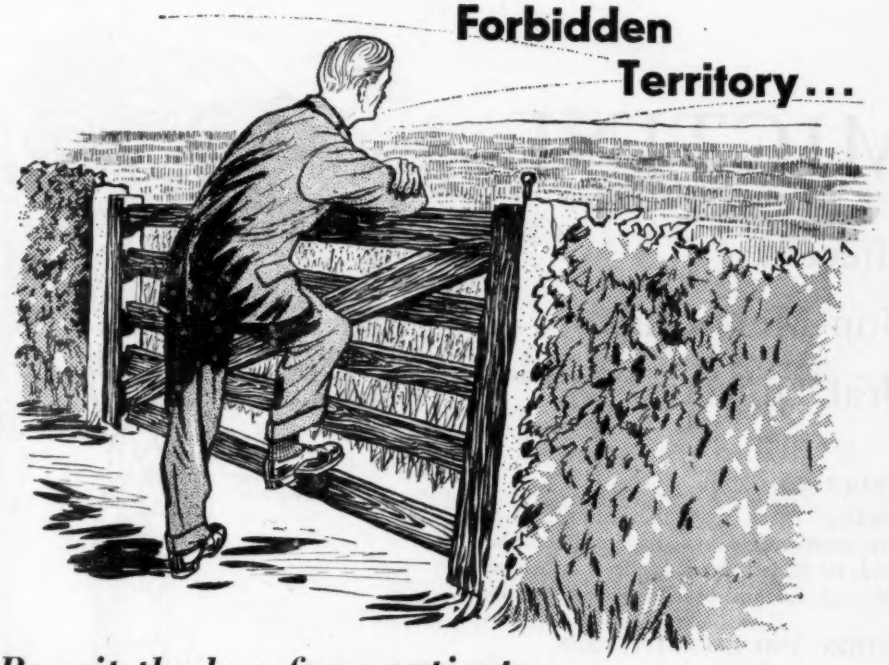
All Wander tuberculostatic products are obtainable from usual pharmacists or direct from

A. WANDER LIMITED

42 Upper Grosvenor Street, Grosvenor Square, London W.1

CANADA: A. Wander Ltd., Peterborough, Ontario. AUSTRALIA: A. Wander Ltd., Devonport, Tasmania. NEW ZEALAND: A. Wander Ltd., Christchurch. INDIA: Khatau Valabhdas & Co., Indian Globe Chambers, Fort Street, Fort, Bombay. I. PAKISTAN: Grahams Trading Co. (Pakistan) Ltd., P.O. Box. 30, Karachi. CEYLON: A Baur & Co. Ltd., Colombo.

M 399



Permit the hay fever patient to get out and about

The hay fever patient views the summer months with dread, but his anticipation and indeed, the realisation of his pleasures and activities need not be marred. With modern therapy, the distressing symptoms can be adequately controlled.

Piriton, an improved antihistamine, is unexcelled in the degree and speed of relief that it affords and its freedom from side-effects.

Piriton is available in a wide range of practical dosage forms to suit all ages.

PIRITON

(Chlorpheniramine maleate)

Piriton Duolets in bottles of 25 and 250 Duolets;
Piriton Tablets in bottles of 25 and 500 tablets;
Piriton Injection in ampoules of 1 c.c. in boxes of 5 and 100 ampoules;
Piriton Syrup in bottles of 4 fluid ounces.

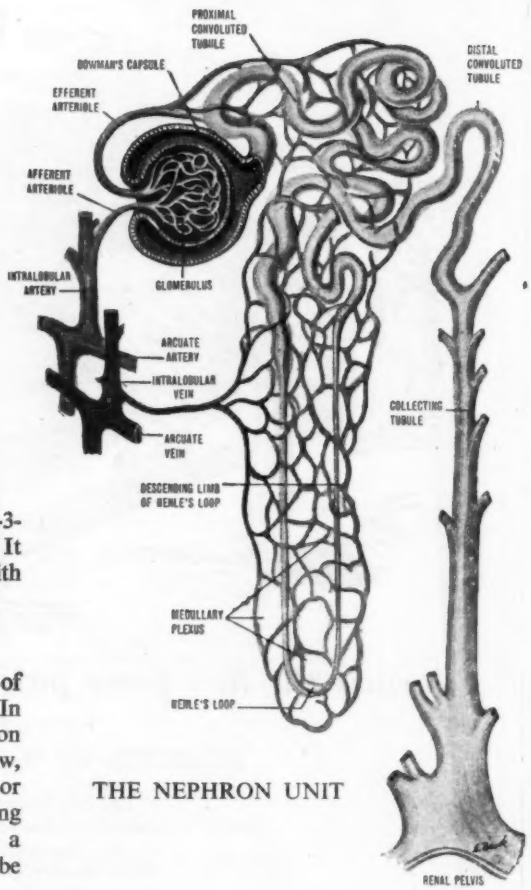
C57/244-5

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE: BISHOPSGATE 3201 (12 LINES). TELEGRAMS: GREENBURYS, BETH, LONDON

A PRODUCT OF SEARLE RESEARCH

MICTINE*

Effective, Non-Mercurial Oral Diuretic



THE NEPHRON UNIT

STRUCTURE

"Mictine," brand of aminometradine, is 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione. It avoids the undesirable side-effects associated with mercurial, xanthine or sulphonamide agents.

ACTION AND EFFECTIVENESS

"Mictine" is believed to act by inhibition of sodium ion absorption in the renal tubule. In therapeutic dosage it has not caused any effect on glomerular filtration rate, renal plasma flow, cardiac output, heart rate or blood pressure, nor any alteration in the blood or blood-forming tissues or in renal or hepatic function. In a group of unselected patients 70 per cent. may be expected to respond to "Mictine".

TOLERANCE

"Mictine" is not toxic at therapeutic dosages. On the other hand, side-effects do occur such as headache and gastro-intestinal symptoms. These are reduced to a minimum if an interrupted dosage scheme is adopted.

ADMINISTRATION

"Mictine" is indicated in the maintenance of an oedema-free state in any patient requiring diuretic therapy and the effecting of initial diuresis in all patients but those with severe congestive failure. For these purposes the dosage is one to four tablets daily in divided doses *during meals* on alternate days or on three successive days followed by four days without therapy. "Mictine" is not intended to produce initial diuresis in more severe congestive failure; however, "Mictine" may be given when other diuretics are contra-indicated, or if tolerance to them has developed.

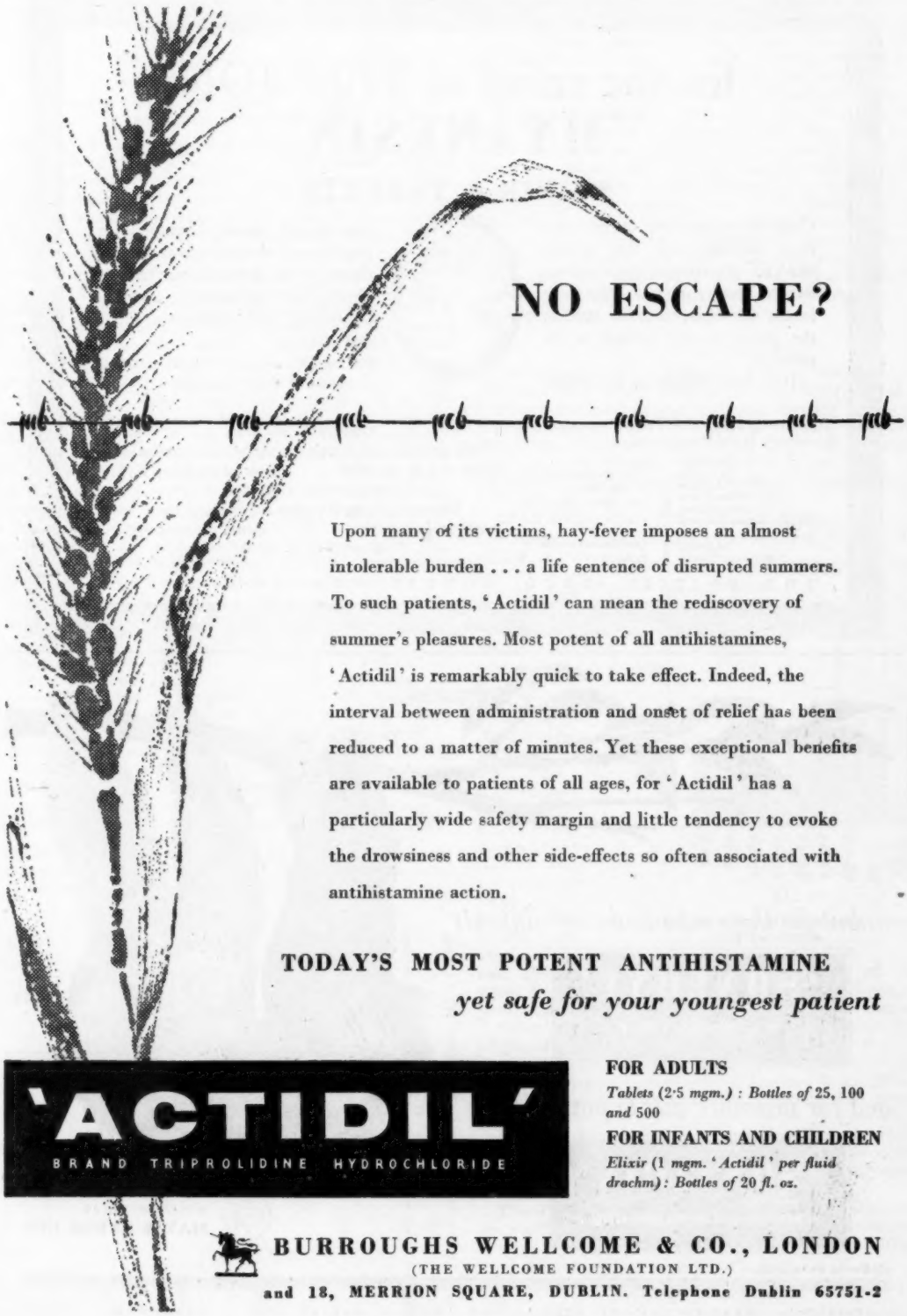
Available in bottles of 25, 100 and 500 tablets each containing 200 mg. aminometradine.

Full literature is available to the medical profession on request. G. D. Searle & Co. Ltd., High Wycombe, Bucks. Tel. High Wycombe 1770.

**Registered Trade Mark*

SEARLE

MI : P86



NO ESCAPE?

Upon many of its victims, hay-fever imposes an almost intolerable burden . . . a life sentence of disrupted summers. To such patients, 'Actidil' can mean the rediscovery of summer's pleasures. Most potent of all antihistamines, 'Actidil' is remarkably quick to take effect. Indeed, the interval between administration and onset of relief has been reduced to a matter of minutes. Yet these exceptional benefits are available to patients of all ages, for 'Actidil' has a particularly wide safety margin and little tendency to evoke the drowsiness and other side-effects so often associated with antihistamine action.

TODAY'S MOST POTENT ANTIHISTAMINE
yet safe for your youngest patient

'ACTIDIL'
BRAND TRIPROLIDINE HYDROCHLORIDE

FOR ADULTS
Tablets (2·5 mgm.) : Bottles of 25, 100 *and* 500
FOR INFANTS AND CHILDREN
Elixir (1 mgm. 'Actidil' per fluid drachm) : Bottles of 20 *fl. oz.*

BURROUGHS WELLCOME & CO., LONDON
(THE WELLCOME FOUNDATION LTD.)
and 18, MERRION SQUARE, DUBLIN. Telephone Dublin 65751-2

for the relief of TENSION

'MYANESIN'
TRADE MARK

ELIXIR & TABLETS

Carefully controlled experiments have demonstrated that muscle tension is greater in anxious patients than in healthy persons. The more severe the symptoms of anxiety the greater is the tension in the muscles.

It is now becoming recognised

that many cases diagnosed as psychogenic rheumatism are in fact cases of anxiety-induced muscle tension and can therefore logically be treated with Myanesin Elixir and Tablets.

The suggested dosage is—One tablespoonful or two tablets four times daily.

Myanesin Elixir and Tablets are also valuable in the treatment of :—

Backache, Headache, Bronchial Asthma, Neurodermatoses, Dysmenorrhoea, Premenstrual Tension — One tablespoonful or two tablets four times daily

Insomnia, Nocturnal Cramp — One tablespoonful at night

'MYANESIN' ELIXIR
One gramme mephenesin in each tablespoonful
Bottle of 8 fl. oz. 4/6 Bottle of 40 fl. oz. 18/6

'MYANESIN' TABLETS
Each containing 0.5 gramme mephenesin
Bottle of 50 at 6/10 Bottle of 500 at 56/-
Basic N.H.S. prices

THE BRITISH DRUG HOUSES LTD. LONDON N.1

MA1964

....but for those who find sleep difficult

'SONERYL'
trade mark brand
BUTOBARBITONE

and for insomnia due to pain

'SONALGIN'
trade mark brand
BUTOPHEN WITH CODEINE

MANUFACTURED BY
MAY & BAKER LTD

M&B brand Medical Products

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ESSEX

LEUKÆMIA *

RONALD BODLEY SCOTT
M.A., D.M. Oxfd, F.R.C.P.
PHYSICIAN TO H.M. THE QUEEN; PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL

THE topic I have chosen is a latter-day affliction, and a glance at the titles of previous Lettsomian lectures shows that leukæmia has never before been their subject. I am, moreover, denied the conventional gestures of filial piety, because it was not until twenty-six years after the death of John Coakley Lettsom that Barth and Donné, at the Hôtel Dieu in Paris, noted "the remarkable predominance of mucous globules" in the blood of a patient with splenic enlargement. Their observation was not published for many years (Donné 1844), and the first recorded examples of leukæmia are to be found in the *Edinburgh Medical and Surgical Journal* of Oct. 1, 1845, where David Craigie and John Hughes Bennett separately reported cases of hypertrophy of the Spleen and Liver in which Death Took Place from Suppuration of the Blood. A few months later Rudolf Virchow (1845) described a case of "Weisses Blut," and there followed an acrimonious wrangle over priority, the faint echoes of which were audible as late as 1885, when William Osler cast the deciding vote for Virchow. Undoubtedly Virchow had more insight than his rivals into the nature of the leukæmic process, and in 1847 he introduced the word "leukæmia" and distinguished splenic and lymphatic varieties. He had, in Osler's words, "vindicated a place in pathology for the white blood corpuscle."

Although acute leukæmia was described by Friedrick a hundred years ago (1857), further advance awaited Paul Ehrlich's (1891) introduction of specific methods of staining the leucocytes. These permitted the recognition of the myeloblast by Otto Naegeli in 1900 and the separation of the cytological varieties of leukæmia. Monocytic leukæmia, the last of these to be identified, was not described until 1913 (Reschad and Schilling 1913).

Although leukæmia is something of a parvenu with barely a hundred and twenty years of respectable ancestry, it has recently become the focal point of hæmatology. Its inevitably fatal outcome and the youth of many of its victims have aroused the interest and sympathy of the physician and have stirred the emotions of the public; it provides the research-worker with a fertile field for his ventures in the chemotherapy of cancer; and the problems of its ætiology have become the concern of the epidemiologist, the statistician, and the radiologist.

These lectures can do little more than touch on some aspects of a subject which has become immense; in the main they will be a record of personal experience of leukæmia, viewed from a clinical and therapeutic standpoint. The present series of some 570 patients has not been collected consecutively; it is undoubtedly weighted by selection; and it must not be regarded as a representative sample of the general leukæmic population. Nevertheless the patients with acute leukæmia form a consecutive series, and those with the chronic varieties, being unselected, may be claimed as fair examples of the totality of sufferers from these diseases.

* The first Lettsomian lecture for 1957, delivered before the Medical Society of London on Feb. 11. The second and third will appear in forthcoming issues.

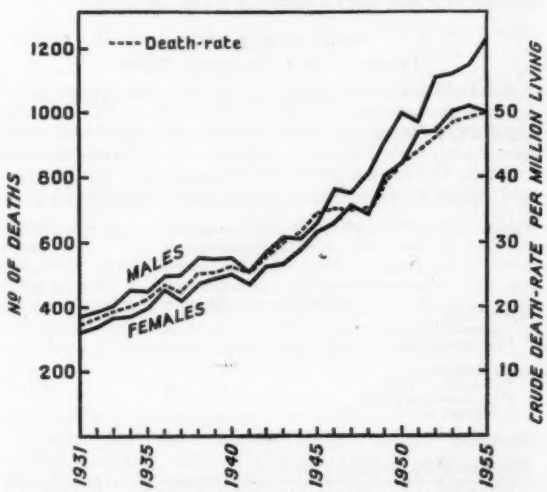


Fig. 1—Mortality due to leukæmia in England and Wales 1931–55.

Incidence of Leukæmia

The disease is still uncommon but its incidence, in all countries from which statistics are available, has shown a steady increase during the past twenty years. In England and Wales the crude death-rate per million living was 17 in 1931 and 50 in 1955, or, in absolute numbers, 685 persons were certified as dying from leukæmia in 1931 and 2224 in 1955 (Registrar-General 1956) (fig. 1).

At all ages below 65 the number of males dying from this cause exceeds the number of females. From 1931 to 1955 the major increase has been in older patients; the age-distribution in 1940 and 1954 are contrasted in fig. 2. Similar changes have been reported from other countries (Cooke 1954, Lancaster 1955, Phillips and Owchar 1955, Gunz and Hough 1956). The only two causes of death which have shown a greater rate of increase during this period are carcinoma of the lung and coronary thrombosis.

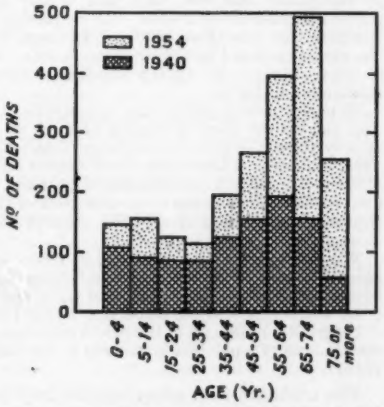


Fig. 2—Age-distribution of deaths due to leukæmia in 1940 and 1954.

Other vagaries in the incidence of leukæmia are a preponderance of urban over rural dwellers, of well-to-do over less well-to-do, and, in the United States, of white over coloured—although this difference is considerably less when the ages are standardised (Hewitt 1955, Meadors 1956).

It seems likely that more precise diagnosis explains some of this increase but certainly not all. It must be accepted that the incidence of the disease is steadily rising.

There is still difficulty in estimating the incidence of the various types of leukæmia. The variations shown in table I are probably to be attributed to selection, although local differences may play a part.

Ætiology of Leukæmia

The nature of the leukæmic process is now generally held to be neoplastic; and, when "cancer" is defined in

TABLE I—INCIDENCE OF MAIN VARIETIES OF LEUKÆMIA

Reference	No. of cases	Acute (%)	Chronic myeloid (%)	Chronic lymphatic (%)	Undetermined (%)
Wintrobe (1956) ..	2424	40·1	29·0	30·9	..
Gunz and Hough (1956)	553	62·3	17·5	14·5	5·7
MacMahon and Clark (1956)	1636	44·5	19·7	24·3	11·5
Gauld et al. (1953) ..	647	41·9	26·4	32·0	..

terms of dynamic cell behaviour, there can be little quarrel with this view. It is undeniably a purposeless progressive uncoördinated cellular proliferation, superfluous to the needs of the host, and continuing after the evocative stimulus (if one can be identified) has ceased to operate. As in other forms of cancer, the abnormality seems to reside within the cells themselves, which exhibit an unrestrained and undisciplined capacity for reproduction. The fundamental cause of leukæmia is thus to be sought in the larger mystery of the cause of cancer, and at present we can only fruitfully inquire into the influences which may play some part in initiating this disorder of cellular behaviour.

External Agents

In man the only external agent whose importance has been established is ionising radiation. Some of the evidence for this contention, which seems irrefutable, is as follows:

The incidence of leukæmia in survivors of the atomic bomb in Hiroshima has been four and a half times that of the general population of Japan. Its frequency in those severely irradiated at less than 2500 metres from the hypocentre of the explosion was 1 in 172, whereas in those outside this radius it was only 1 in 12,912 (Moloney 1955, Moloney and Kastenbaum 1955).

In patients with ankylosing spondylitis treated by irradiation the deaths from leukæmia amount to between ten and twenty times the expected number (Court Brown and Abbatt 1955, Abbatt and Lea 1956, Court Brown and Doll 1956).

There are reports of leukæmia in patients previously irradiated for thymic tumours or treated with radioactive iodine for thyrotoxicosis (Blom et al. 1955, Abbatt et al. 1956, Pochin et al. 1956).

The mortality from leukæmia in radiologists between the ages of 35 and 74 is three and a half times that of other members of the medical profession, and eight and a half times that of all white males of the same age (Peller 1952).

Diagnostic radiology of the pelvis in pregnancy may increase the chances of leukæmia appearing in the child (Stewart et al. 1956).

The evidence that other agents may be leukæmogenic is less convincing:

The best attested is perhaps chronic benzene poisoning, the causal efficacy of which is accepted in France as beyond question (Bernard and Braier 1951). I have experience of an instance in which two men were exposed to the fumes of benzene: one developed an aplastic anæmia from which he recovered, and the other died from acute myeloblastic leukæmia.

Acute leukæmia following marrow aplasia due to chloramphenicol has been recorded (Lebon and Messerschmitt 1955). It has also been reported after agranulocytosis due to sulphonamide (Wilkinson 1955). It seems probable that regeneration of the bone-marrow after severe injury may transcend the physiological and assume neoplastic characters.

The termination of idiopathic aplastic anæmia in acute leukæmia is well recognised (Wintrobe and Mitchell 1940, Black and Meynell 1951), and I have observed it on 3 occasions.

Heredity

A genetic basis for leukæmia has been suggested by the occasional report of several cases in one family:

Videbæk (1947) obtained a family history of the disease in 8% of 209 patients; it was particularly frequent in the chronic lymphatic form.

Analyses of larger series have not confirmed his claims; Gusseh (1954) noted consanguineous leukæmia only 39 times in 8586 collected cases, an incidence of 0·5%.

Of my patients, there was a family history of leukæmia in 3 of 228 with chronic lymphatic leukæmia but in none with the other varieties. In 1 patient the disease appeared within six months of the death, from the same cause, of her mother, whom she had nursed.

There are several records of twins, uniovular and binovular, both developing leukæmia (Cooke 1953, Anderson and Hermann 1955). As a random event it has been estimated that this would happen once in a hundred and fifty years in the United States.

It seems likely, therefore, that genetic factors are sometimes operative, but their importance cannot be great.

Zoological Distribution

Leukæmia has been reported in almost every species of the animal kingdom, from the vulture to the sea-lion (Engelbreth-Holm 1942). The relation between the human and animal forms of the disease remains uncertain, but much investigative effort has been expended on the second in the hope of shedding light on the first. Most of the research has been directed towards discovery of the cause. As long ago as 1908 it was proved that fowl leukæmia was due to a virus which invaded the blood-cells and apparently endowed them with malignant qualities (Ellerman and Bang 1908). Beard (Bonar et al. 1956) has recently been able to show that there are two distinct, but closely related, viruses which are responsible for avian myeloblastosis and erythroblastosis. No other leukæmia is yet established as due to a virus.

Mouse leukæmia has been the most commonly used for research. The mouse is particularly liable to a lymphatic form of the disease, and the importance of genetic factors is shown by the breeding of strains in which 60–70% of individuals eventually die of spontaneous leukæmia. It is generally held that transmission is possible only when live cells are inoculated, although recently Gross (1953) and others have claimed successful passage with cell-free filtrates. A number of different agents apparently influence the incidence of the disease and the susceptibility of animals to inoculation.

The application of these observations to the problem of the cause of leukæmia in mice is sufficiently obscure and their relevance to human disease quite unproven. Some believe that the agents mentioned disturb cellular equilibrium in a way which initiates the leukæmic process, and that, once established, this perpetuates itself. Others cling tenaciously to the viral hypothesis; among these are Schwartz et al. (1956), who claim to have recovered from the brains of some patients dying from leukæmia an agent which will accelerate the development of the disease in a susceptible strain of mice.

ACUTE LEUKÆMIA

Incidence of Cytological Types

Acute leukæmia is distinguished from the chronic form by the immaturity of the proliferating cells and the rapidity of its course. Myeloblastic, lymphoblastic, and monocytic varieties are recognised, but the distinction between the several primitive elements may be difficult, and refuge is often sought in the evasive qualification of

TABLE II—DISTRIBUTION OF 169 CASES OF ACUTE LEUKÆMIA BY CYTOLOGICAL TYPES

Cytological type	Male	Female
Myeloblastic:		
"Classical" type	35	44
Erythromyelosis	2	3
Lymphoblastic:		
"Classical" type	23	9
Pure medullary type	10	5
Sternberg type	7	3
Monocytic	12	11
Erythræmia (Di Guglielmo 1926) ..	4	1
Total	93	76

TABLE III—INCIDENCE OF CYTOLOGICAL TYPES OF ACUTE LEUKÆMIA

Reference	No. of cases	Myeloblastic (%)	Lymphoblastic (%)	Monocytic (%)	Undetermined (%)
Rosenthal and Harris (1935)	173	77·4	18·5	4·1	..
Gauld et al. (1953)	271	25·2	53·4	21·4	..
Gunz and Hough (1956)	346	38·2	37·6	2·0	22·2
Present series	169	49·7	33·7	13·6	..

"stem cell." There is, therefore, considerable variation in the reported incidence of the different types. The present series is not to be regarded as unselected, because leukæmia in childhood is the province of the pædiatrician, and it consequently contains a disproportionate number of adults (table II). This has the effect of reducing the numbers of the lymphoblastic variety, which is particularly common during the first decade. The variability of reported series is shown in table III.

More males than females fall victim to acute leukæmia, an inequality due to the frequency of the lymphoblastic type in male children. The age-incidence of the three varieties shows striking differences (fig. 3). Myeloblastic leukæmia is spread evenly throughout the whole span of life; lymphoblastic is predominantly a disease of children; and monocytic affects mainly the middle-aged.

Clinical Picture

A detailed clinical description of acute leukæmia would be inapposite, and the following account is but a summary review. The different cytological varieties seldom present clear-cut clinical differences. The ingredients which go to make up the picture are anæmia; a hæmorrhagic state; enlarged lymph-nodes, spleen, and liver, sometimes with infiltrations in other tissues; and secondary infective phenomena. The accent may fall sometimes on one and sometimes on another of these features.

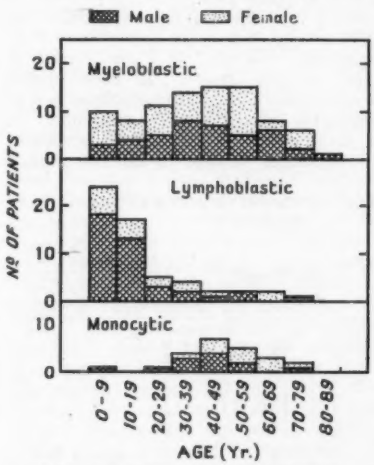


Fig. 3—Age-incidence of acute leukæmia.

Myeloblastic Leukæmia

In myeloblastic leukæmia the presenting symptom is usually anæmia, often of insidious onset and often combined with a hæmorrhagic state. The spleen may be felt, but lymph-node enlargement is unusual. Skin infiltrations, usually papular, are not rare. In children subperiosteal chloromatous tumours are occasionally noted. Fever is common, and this is more often the result of infection than was previously believed. Spongy gums, with ulcerated margins oozing blood, are a familiar feature.

Lymphoblastic Leukæmia

Lymphoblastic leukæmia presents in one of three clinical guises: anæmia combined with lymph-node enlargement, splenomegaly, enlargement of the liver, and infiltrations in various tissues, may be called the "classical" form of the disease. The second, or pure medullary, type is common in young children. Here anæmia and perhaps a hæmorrhagic state are the only initial signs. There is no enlargement of the liver, spleen, or superficial lymph-nodes. In this variety pain in bones and joints is often a prominent symptom, and many patients are admitted to hospital with a diagnosis of rheumatic fever or osteomyelitis. The third variant, or the Sternberg type, has been described as acute lymphosarcoma-cell leukæmia, although there seems to be no justification for excluding it from the present category. The patient presents with a nodal tumour, usually in the mediastinum, but in 1 of my patients it was in the nasopharynx. At this stage the blood-count may be normal, but within a few days to a few weeks lymphoblasts have invaded the blood, the total leucocyte-count has risen, perhaps to 200,000 per c.mm., and anæmia and thrombocytopenia have made their appearance. Some authors believe that the predominant cell in this variety can be distinguished from the lymphoblast of other types of acute lymphoblastic leukæmia.

Monocytic Leukæmia

Monocytic leukæmia differs little from myeloblastic in its clinical features, except in its particularly frequent association with gingivitis and stomatitis. The cervical lymph-nodes may be enlarged, but rarely are those of other groups affected; the spleen is usually not palpable.

Other Forms

Sometimes the anaplastic process affects the precursors of the red blood-cells exclusively, and the resulting disorder is termed acute erythræmia or Di Guglielmo's disease (Di Guglielmo 1926). Intermediate forms marked by myeloblastic and erythroblastic proliferation are spoken of as acute erythromyelosis. In many instances these cytological changes are transient and later give place to a pure myeloblastic proliferation. Their clinical features do not separate them from acute leukæmia *sensu stricto*; fever, profound anæmia, splenohepatomegaly, and a hæmorrhagic state accompany their rapidly progressive decline.

Occasionally acute leukæmia declares itself after a long period of ill health whose features have been those of aplastic anæmia, chronic neutropenia, or thrombocytopenia. This initial illness has been termed "pre-leukæmia," but the relationship to the conventional form of the disease is uncertain (Block et al. 1953). 3 cases of this variety have been excluded from the present series as well as 1 case each of polycythæmia and myelosclerosis terminating in acute leukæmia.

Blood Picture

The diagnosis of acute leukæmia is established only by examining the blood and bone-marrow. Some anæmia is constant. The peripheral leucocyte-count varies; indeed, leucopenia is rather more common than the high counts previously regarded as characteristic. Whatever the total, a proportion of primitive cells is almost always found. Thrombocytopenia may be absent in the early stages, but with progress of the disease it is invariable.

When the changes in the peripheral blood are inconclusive, the diagnosis is established by bone-marrow puncture, which will reveal in almost every instance a replacement of the normal cells by myeloblasts, lymphoblasts, or primitive monocytes. The interpretation of the erythroblastic, or mixed erythroblastic and myeloblastic, proliferations of Di Guglielmo's disease and erythromyelosis may be difficult to those unfamiliar with these less common variants.

Treatment

The management of patients with acute leukæmia presents the physician interested in hæmatology with his greatest challenge. The disease remains obstinately fatal, and it has been suggested that humanitarian consider-

ations should forbid attempts to procure remission which can never be more than transient. There can, however, be no doubt in the minds of those who see many of these patients that such an attitude is indefensible. This nihilistic approach demoralises the patient, his relatives, and his medical attendant; moreover it erects an impenetrable barrier against therapeutic advance. Even a few more months of life may be immeasurably precious, and it is the physician's duty to do all that is possible to procure this temporary reprieve.

The fundamental aim of treatment is to control the neoplastic process and restore normal cellular behaviour in the hæmopoietic system; but, before the measures aimed at this goal are described, symptomatic treatment must be considered.

SYMPTOMATIC TREATMENT

The patient with acute leukæmia is a ready victim of infections, general and local. Septicæmia should always be suspected when there is high fever, and, if blood-culture establishes its presence, the appropriate antibiotic should be prescribed. 2 recent patients, in whom complete remissions were later procured, presented with general infections by *Streptococcus hæmolyticus* and *Staphylococcus pyogenes*. Local infections of the mouth, respiratory tract, and skin demand bacteriological identification and the correct antibacterial agent. Monilial invasion of the mouth, throat, and œsophagus is particularly frequent, especially when steroid hormones are used; in such cases 'Nystatin' has proved invaluable. Mouth-washes of 1·5% hydrogen peroxide or of a saturated solution of sodium perborate do much to relieve the discomfort of leukæmic stomatitis.

Routine or prophylactic use of antibiotics is inadvisable. These drugs should be prescribed only when the generally accepted indications exist, and the discomfort of intramuscular injection in the patient with a hæmorrhagic state must be borne in mind.

The importance of the tendency to bleed is shown by the fact that, in 23 of 55 patients examined post mortem, hæmorrhage had apparently been the immediate cause of death, and in 14 of them the bleeding had been intracranial. There is a close parallel between the platelet-count and the tendency to bleed; but it is common to see thrombocytopenia without significant bleeding for weeks, or even months, terminating in an explosive and rapidly fatal hæmorrhagic state. It is possible that this sudden change is sometimes brought about by the appearance of a fibrinolysin or a circulating anticoagulant, either of which may owe its origin to bacterial invasion (Freeman 1952). The control of infection is therefore important in control of the hæmorrhagic state. Other measures are of little avail: simple blood-transfusion is seldom effective, but platelet transfusions have some transient benefit, although they rapidly lose their virtue (Stefanini and Bernfeld 1953). The steroid hormones may temporarily decrease the tendency to bleed. Intravenous injections of a chloroform extract of acetone-washed brain may prove valuable (Hayhoe and Whitby 1955).

Electrolyte disturbances are common in the acutely ill leukæmic patient and require correction. A low serum-potassium level has been noted in several cases (Videbæk 1951), and in 1 case many of the symptoms were due to hypercalcæmia (Mawdsley and Holman 1957).

Blood-transfusion is the only method of relieving anæmia, but there is some evidence that it may have a more profound effect. Remission has often been noted to follow it (Dreyfus 1948), and this observation was the rationale for exsanguination-transfusion, which enjoyed a certain therapeutic vogue a few years ago (Bessis and Dausset 1950). Its action has more recently been attributed to liberation of adrenal steroids as the result of transfusion shock (Bessis 1954). This point has again been underlined by a report of remissions thus induced in 34% of 41 patients (Hayhoe and Whitby 1955). In the present series significant remissions were noted in 9 (19·5%) of 46 patients treated by transfusion alone. Exsanguination-transfusion was undertaken in only 3, but in none of these was the course of the disease obviously altered.

Blood-transfusion has no place as a definitive means of treatment, but it should be prescribed in quantities sufficient to maintain a hæmoglobin level of 9 g. per 100 ml. while attempts are made to control the leukæmic process. It should always be a purposive measure and not a resort faute-de-mieux.

SPECIFIC MEASURES

The agents which may exert partial or complete, although never more than temporary, control over the leukæmic process are the steroid drugs and certain antimetabolites.

Steroid Hormones

Cortisone was shown to inhibit the growth of transplanted lymphosarcoma in mice as long as thirteen years ago (Heilman and Kendall 1944), but it was not used in human leukæmia until 1950 (Farber et al. 1950, Pearson et al. 1950). Analysis of published series shows that of 425 patients treated with cortisone or corticotrophin there was complete remission in 29% and partial in 24% (Fessas et al. 1954). The expression "complete remission" is defined as a disappearance of all symptoms and physical signs of disease, the restoration of a normal blood picture, and the presence in the bone-marrow of the sum of "blast" cells and lymphocytes in a proportion of less than 20% of the total. Subsequent experience has shown that complete remission may be expected in children with lymphoblastic leukæmia and not rarely in adults with this form of the disease. In myeloblastic leukæmia it is less commonly obtained in children and in adults rarely. Monocytic leukæmia never responds.

There is, indeed, some evidence that steroid hormones may accelerate the leukæmic process in the last-named forms (Fessas et al. 1954). In the present series the results obtained with cortisone or corticotrophin are set out in table IV.

TABLE IV—RESULTS OF TREATMENT OF ACUTE LEUKÆMIA WITH STEROIDS

Cytological type	No. of cases	Remissions	
		Complete	Partial
Myeloblastic:			
Adults	13	2	1
Children	5	2	2
Lymphoblastic:			
Adults	10	4	2
Children	10	6	2
Monocytic:			
Adults	4	0	0
Total	42	14	7

The daily dose of cortisone required is 200–300 mg. in adults and up to 200 mg. in children. Corticotrophin is given by intramuscular injection every six hours in daily doses of 200 mg. for adults and 100 mg. for children, or by intravenous infusion in quantities of 25–50 mg. in eight to twelve hours. Some workers have claimed more satisfactory results in adults by using prednisolone in a dosage as high as 5 g. daily (Hill et al. 1956).

Remission with steroid drugs is usually established in the third or fourth week of treatment. It seldom lasts more than six weeks, and relapse is not prevented by maintenance dosage. If treatment is intermittent, second remissions may sometimes be obtained in children, but rarely in adults.

Antimetabolites

An antimetabolite is an agent which obstructs the working of an enzyme system. By virtue of its chemical similarity to the metabolite or raw material of the system in question, it becomes united with the enzyme. It differs, however, sufficiently from the enzyme to prevent the reaction from proceeding to completion. A chemotherapeutic spanner has been thrown into the metabolic works; the pathway is blocked and deficiency of the essential final product results. The antimetabolites which have proved of value in acute leukæmia are those which interfere with the synthesis of nucleic acid.

Folic-acid antagonists.—The first to be used were the folic-acid antagonists. The step was taken empirically after the observation that the leukæmic process was accelerated by giving a folic-acid conjugate (Farber et al. 1948). Those in common use are the 4-amino antagonists of pteroylglutamic acid (folic acid): aminopterin (4-amino-pteroylglutamic acid) and amethopterin or methotrexate (4-amino-N^{10}-methylpteroylglutamic acid). These drugs prevent the conversion of pteroylglutamic acid to citrovorum factor and, by interfering with the action of the second, impede the synthesis of nucleic-acid purines.

The folic-acid antagonists have little or no place in the treatment of adults, but in children remission is procured in 60–70% of cases of lymphoblastic leukæmia (Burchenal 1952, Fountain 1954). They are given by mouth: aminopterin in doses of 0·5–1·0 mg. daily in children and up to 3 mg. a day in adults, and methotrexate in doses of 2·5–5·0 mg. and up to 10 mg. a day respectively. Remission may not appear for eight weeks; it may endure for as long as two years, but the mean lies between two and three months. Second remissions may occur, but resistance finally develops. Severe toxic symptoms are not uncommon and may supervene in a few days or be delayed for months: the earliest is stomatitis, followed by diarrhœa, vomiting, loss of hair, and sometimes gastro-intestinal hæmorrhage.

The folic-acid antagonists have not been used extensively in this series. Partial remission was obtained in 3 of 5 children with myeloblastic, and in 2 of 6 with lymphoblastic, leukæmia. 1 of 2 adults with monocytic leukæmia had a short incomplete remission.

Mercaptopurine.—Many other antimetabolites have been subjected to clinical trial, but the only ones of proved value are the purine antagonists, which interfere with nucleic-acid synthesis at a different stage of metabolism. The first shown to have an antileukæmic effect was 2 : 6-diaminopurine (Burchenal et al. 1951), but this was rapidly superseded by the more effective 6-mercaptopurine (Burchenal et al. 1953). The customary daily dose of this drug is 2·5 mg. per kg. body-weight. Three to eight weeks is needed for remission to occur, and toxic effects, other than leucopenia, are rare. Treatment is continued until the bone-marrow is hypocellular and the sum of lymphocytes plus "blast" cells is below 20% of the total. If this has not been achieved at the end of eight weeks, the dosage may be doubled, and sometimes a delayed response is noted. When remission has been obtained, a maintenance dosage of 2·5–1·25 mg. per kg. body-weight is continued. In this series the smaller dosage has been preferred.

Many reports are available of the value of this drug (Conference on 6-Mercaptopurine 1954). In general about a third of the children and about a seventh of the adults treated have shown remission, which lasted from one week for as long as a year, with a mean of three or four months. In all cases the disease eventually becomes resistant. The chance of remission appears to bear less relation to the cytological variety of leukæmia than when folic-acid antagonists are used. In the present series 6-mercaptopurine was given to 51 patients with the results set out in table v.

TABLE V—RESULTS OF TREATMENT OF ACUTE LEUKÆMIA WITH 6-MERCAPTOPURINE

Cytological type	No. of cases	Remissions	
		Complete	Partial
Myeloblastic:			
Adults	18	6	3
Children	8	2	3
Lymphoblastic:			
Adults	10	5	2
Children	10	5	2
Monocytic:			
Adults	5	1	0
Total	51	19	10

Analogues of 6-mercaptopurine, thioguanine, and 6-chloropurine are on trial (Murphy et al. 1955). There is some evidence that the second increases the frequency of complete remission in adults (Ellison 1956). In some adults in whom acute leukæmia has become refractory to 6-mercaptopurine a second remission has been obtained with folic-acid antagonists (Ellison 1956).

Azaserine.—There is, too, some evidence that a glutamine antagonist, azaserine, will increase the length of remission in children when given with 6-mercaptopurine (Ellison et al. 1954, Burchenal et al. 1955).

Prognosis

Acute leukæmia remains stubbornly fatal. Its course is so variable that figures of average duration have little meaning. Analysis of published series has shown that there is no statistical proof of significant increase in the total survival when "specific" drugs are used (Haut et al. 1955).

In the present series, in 81 patients treated with blood-transfusion and antibiotics alone the mean length of survival from the first symptom was 20·2 weeks, and in 63 who received in addition "specific" treatment 21·7 weeks. These figures provide no cause for optimism, but we have at present 6 patients in complete remission. With all humility it may be claimed that there are, at least, grounds for hope and encouragement in this recently acquired ability occasionally to halt for a while the formerly unrelenting malignant process known as acute leukæmia.

REFERENCES

Abbatt, J. D., Farran, H. E. A., Greene, R. (1956) *Lancet*, i, 782.
— Lea, A. J. (1956) *Ibid*, ii, 1317.
Anderson, R. C., Hermann, H. W. (1955) *J. Amer. med. Ass.* **158**, 652.
Bennett, J. H. (1845) *Edinb. med. surg. J.* **64**, 413.
Bernard, J., Braier, L. (1951) *Int. Congr. int. Soc. Hemat.* p. 251.
Bessis, M. (1954) *In* Ciba Foundation Symposium on Leukæmia Research. London; p. 36.
— Dausset, J. (1950) *Rev. Hémat.* **5**, 188.
Black, A. B., Meynell, M. J. (1951) *Brit. med. J.* i, 1430.
Block, M., Jacobson, L. O., Bethard, W. F. (1953) *J. Amer. med. Ass.* **152**, 1018.
Blom, P. S., Querido, A., Leeksma, C. H. W. (1955) *Brit. J. Radiol.* **28**, 165.
Bonar, R. A., Sharp, D. G., Beard, D., Beard, J. W. (1956) *Proc. Soc. exp. Biol., N.Y.* **92**, 774.
Burchenal, J. H. (1952) *Acta hæmat.* **7**, 193.
— Karnofsky, D. A., Laird Myers, W. P., Escher, G. C., Craver, L. F., Dargeon, H. W., Rhoads, C. P. (1951) *Cancer*, **4**, 549.
— Murphy, M. L., Ellison, R. R., Sykes, M. P., Tan, T. C., Leone, L. A., Karnofsky, D. A., Craver, L. F., Dargeon, H. W., Rhoads, C. P. (1953) *Blood*, **8**, 965.
— — Tan, C. T. C., Yuceoglu, M., Karnofsky, D. A. (1955) *Proc. Soc. pediat. Res.* June.
Conference on 6-Mercaptopurine (1954) *Ann. N.Y. Acad. Sci.* **60**, 183.
Cooke, J. V. (1953) *J. Amer. med. Ass.* **152**, 1028.
— (1954) *Blood*, **9**, 340.
Court Brown, W. M., Abbatt, J. D. (1955) *Lancet*, i, 1283.
— Doll, R. (1956) *In* The Hazards to Man of Nuclear and Allied Radiations. H.M. Stationery Office.
Craigie, D. (1845) *Edinb. med. surg. J.* **64**, 400.
Di Guglielmo, G. (1926) *Boll. Soc. med. clin.* **1**, 665.
Donné, A. (1844) Cours de microscopie complémentaire des études médicales, anatomie microscopique et physiologie des fluides de l'économie. Paris.
Dreyfus, B. (1948) *Rev. Hémat.* **3**, 29.
Ehrlich, P. (1891) Farbenanalytische Untersuchungen zur Histologie und Klinik des Blutes. Berlin.
Ellerman, V., Bang, O. (1908) *Cbl. Bakt.* **46**, 595.

References continued overleaf

THE NATURE AND ORIGIN OF THE MAMMOTROPHIC AGENT PRESENT IN HUMAN FEMALE URINE

GEOFFREY HADFIELD
M.D. Lond., F.R.C.P., F.R.C.S.

DIRECTOR OF THE CLINICOPATHOLOGICAL LABORATORIES OF THE IMPERIAL CANCER RESEARCH FUND, LINCOLN'S INN FIELDS, LONDON; CONSULTING PATHOLOGIST TO ST. BARTHOLOMEW'S HOSPITAL

THE urine of normal premenopausal women, when injected into the intact weanling males of certain strains of albino mice, induces an easily recognisable growth response in their primitive mammary glands. Histological studies have shown that the essential feature of this response is a highly significant increase in the rate of proliferation of mammary epithelium (Hadfield and Young 1956a). The urine of 57% of normal postmenopausal women also contains this mammotrophic agent (Hadfield and Young 1956b).

It has been found impossible to induce this growth response to urine in the mammæ of intact weanling males of the large majority of available strains of laboratory mice. Of 37 strains examined, in 2 only—S.A.S.3 and Strong A_2G—were the mammæ found to be sensitive to urinary mammotrophin, although all strains reacted promptly and vigorously to ovarian œstrone. The 35 strains in which the intact weanling males were insensitive to urinary mammotrophin proved to be equally insensitive to pituitary prolactin alone. On the other hand, the 2 strains in which vigorous mammary growth responses were induced by prolactin also showed an identical response to human female urine (Young 1957). These results suggest, but afford no proof, that the mammotrophic agent present in female urine is pituitary prolactin.

Acting on this suggestion a trial series of preoperative tests were carried out on seven patients suffering from metastatic breast cancer in whom hypophysectomy was under consideration. The urine of three cases was found to be mammotrophic, and hypophysectomy in these was followed by unmistakable regression of growth in the tumour and its metastases. No regression followed the operation in the remaining four patients whose urine failed to produce a mammary response in intact male weanling mice of a strain known to be sensitive both to urinary mammotrophin and to prolactin.

These results are admittedly inconclusive, for the reactions were obtained in intact animals. Nevertheless they suggest that an estimation of the mammotrophic potency of the urine, by providing information regarding the mammotrophic function of the hypophysis, might be of assistance in the selection of cases of breast cancer likely to benefit from hypophysectomy. Such a test, however, carries serious clinical implications, and it would be unjustifiable to advocate its use until more is known about the organ of origin of the mammotrophin in human urine. The investigations reported here were designed to solve this problem.

It has been established by Lyons, Li, and their associates (1955), using hypophysectomised rats, that an advanced degree of mammary growth and differentiation can be induced in gonadectomised immature males and ovariectomised virgin females by the injection of ovarian œstrogen and progesterone together with pituitary prolactin in a carefully predetermined dose-ratio. None of these hormones alone was capable of inducing proliferation of mammary epithelium, and combinations of them in pairs proved equally ineffective. It is difficult, therefore, to escape the conclusion that the "mammogenic triad" of hormones—œstrone, progesterone, and prolactin—is, in the rat at least, directly and specifically responsible not only for lactogenesis but also for the normal proliferation and differentiation of the mammary epithelium which determines the formation of a functionally competent organ.

The general plan of the rat experiments of Lyons has been followed in the investigations reported in this paper. It has been shown that the epithelial proliferation which leads to mammogenesis in hypophysectomised immature male mice of the Strong A_2G strain is totally dependent on the synergistic action of the same "mammogenic triad" of hormones as controls this process in the rat. As the main purpose of the investigations was to determine the nature and origin of the mammotrophic agent present in human female urine, a second series of experiments was carried out in which the prolactin component of the "mammogenic triad" was omitted and unaltered premenopausal female urines, or extracts prepared from such urines, were injected in its place.

Methods

Age and Weight of Animals

Males of the Strong A_2G strain weaned at the age of 21 days were hypophysectomised between the 23rd and 28th day, the body-weight at hypophysectomy varying between 9 and 14 grammes. The operative technique used was that of Thomas (1938), in which the base of the skull is reached by a lateral pharyngeal approach and the pituitary exposed by dividing the occipito-sphenoidal synchondrosis, incising the basi-occipital bone transversely 2·25 mm. behind the synchondrosis, and removing the rhomboidal panel of bone which lies between the incisions. This operation becomes more difficult as the weanling grows and the skull base becomes increasingly ossified and therefore more vascular.

Criteria for Total Ablation

The body-weight falls for a few days after total hypophysectomy and then rather slowly rises. At the 10th

DR. BODLEY SCOTT: REFERENCES—*continued*

Ellison, R. R. (1956) *Med. Clin. N. Amer.* **40**, 743.
— Karnofsky, D. A., Sternberg, S. S., Murphy, M. L., Burchenal, J. H. (1954) *Cancer*, **7**, 801.
Engelbreth-Holm, J. (1942) Leukæmia in Animals. Edinburgh.
Farber, S., Diamond, L. K., Mercer, R. D., Sylvester, R. F. jun., Wolff, J. A. (1948) *New Engl. J. Med.* **238**, 787.
— Downing, V., Kennedy, B. H., Schwachman, H., Toch, R. (1950) *Blood*, **5**, 787.
Fessas, P., Wintrobe, M. M., Thompson, R. B., Cartwright, G. E. (1954) *Arch. intern. Med.* **94**, 384.
Fountain, J. R. (1954) *Edinb. med. J.* **61**, 69.
Freeman, G. (1952) *Blood*, **7**, 235.
Friedrick, N. (1857) *Virchows Arch.* **37**, 12.
Gauld, W. R., Innes, J., Robson, H. N. (1953) *Brit. med. J.* i, 585.
Gross, L. (1953) *Cancer*, **6**, 153.
Gusach, J. (1954) *Sang*, **25**, 384.
Gunz, F. W., Hough, R. F. (1956) *Blood*, **11**, 882.
Haut, A., Altman, S. J., Cartwright, G. E., Wintrobe, M. M. (1955) *Ibid*, **10**, 875.
Hayhoe, F. G. J., Whitby, L. E. H. (1955) *Brit. J. Hæmat.* **1**, 1.
Heilman, F. R., Kendall, E. C. (1944) *Endocrinology*, **34**, 416.
Hewitt, D. (1955) *Brit. J. prevent. soc. Med.* **9**, 81.
Hill, J. M., Falco, D., Marshall, G. J. (1956) *Int. Congr. int. Soc. Hemat.* p. 180.
Lancaster, H. O. (1955) *Med. J. Aust.* ii, 1064.
Lebon, J., Messerschmitt, J. (1955) *Sang*, **26**, 799.
MacMahon, B., Clark, D. (1956) *Blood*, **11**, 871.
Mawdsley, C., Holman, R. L. (1957) *Lancet*, i, 78.
Meadors, G. F. (1956) *Publ. Hlth Rep., Wash.* **71**, 103.
Moloney, W. C. (1955) *New Engl. J. Med.* **253**, 88.
— Kastenbaum, M. A. (1955) *Science*, **121**, 308.
Murphy, M. L., Tan, T. C., Ellison, R. R., Burchenal, J. H. (1955) *Proc. Amer. Ass. Cancer Res.* **2**, 36.
Naegeli, O. (1900) *Dtsch. med. Wschr.* **26**, 287.
Osler, W. (1885) *In* Pepper, W. A System of Practical Medicine by American Authors. Philadelphia; vol. III, p. 908.
Pearson, O. H., Eliel, L. P., Talbot, T. R. jun. (1950) *Bull. N.Y. Acad. Med.* **26**, 235.
Peller, S. (1952) Cancer in Man. New York.
Phillips, A. J., Owchar, M. (1955) *Canad. med. Ass. J.* **73**, 626.
Pochin, E. E., Myant, N. B., Corbett, B. D. (1956) *Brit. J. Radiol.* **29**, 31.
Registrar-General (1956) Statistical Review of England and Wales for the year 1955. H.M. Stationery Office.
Reschad, H., Schilling, V. (1913) *Münch. med. Wschr.* **60**, 1981.
Rosenthal, N., Harris, W. (1935) *J. Amer. med. Ass.* **104**, 702.
Schwartz, S. O., Schoolman, H. M., Szanto, P. B. (1956) *Cancer Res.* **16**, 559.
Stefanini, M., Bernfeld, P. (1953) *New Engl. J. Med.* **248**, 797.
Stewart, A., Webb, J., Giles, D., Hewitt, D. (1956) *Lancet*, ii, 447.
Videbæk, A. (1947) Heredity in Human Leukæmia and its Relation to Cancer. London.
— (1951) *Lancet*, ii, 912.
Virchow, R. (1845) *Frorieps Notizen*, **36**, 151.
— (1847) *Med. Ztg., Berl.* **9**, 15.
Wilkinson, J. F. (1955) Modern Trends in Blood Diseases. London; p. 247.
Wintrobe, M. M. (1956) Clinical Hematology. 4th ed., London.
— Mitchell, D. M. (1940) *Quart. J. Med.* **9**, 67.

postoperative day, if total ablation has been achieved, the body-weight has hardly reached the preoperative level but occasionally exceeds it by about 5%. Over the same period, and within the same age range, normal intact untreated A_2G male weanlings were found to show an average gain of 77% of the body-weight. Excluding the animals given prolactin, weight loss, weight stasis, or a gain at the 10th postoperative day not exceeding 5% of the body-weight at operation, was accepted as provisional evidence of total ablation.

Prolactin is contaminated to a varying degree by growth hormone, and hypophysectomised animals given prolactin showed a significantly higher postoperative weight gain than the others, the increase being proportional to the dose of prolactin. A gain not exceeding 7·5% of the body-weight has therefore been accepted as provisional evidence of total ablation in animals given prolactin. On the basis of post-operative weight gain outside these limits, the results obtained in 17% of the hypophysectomised animals have been discarded.

Duration of Injection Period

Two injections of hormones or urine per mouse per day for 5 days were given in all experiments. This does not allow sufficient time for full glandular differentiation and lobule formation in reacting glands, but early acinisation could be clearly discerned in a considerable propoftion of them.

Estimation of Mammotrophic Potency

The primitive mammæ of normal intact weanling males grow slowly up to sexual maturity, and in the minority the duct-ends show an inconspicuous swelling. Glands in which recent growth acceleration has been induced by hormones or urine show prominent, richly cellular, deeply stained, or partly acinised end-bulbs or "clubs," composed of closely packed undifferentiated epithelium in which mitoses are numerous. Histological studies of weanling male mammæ have demonstrated that the presence of clubs whose diameter is double or more that of their parent duct affords irrefutable evidence of recent and abnormally rapid cellular multiplication induced by a specific exogenous hormonal stimulus. Clubs of this size, including those showing early acinisation, were counted in all the mammæ dissected from animals in each experimental group, and the average number of large, deeply stained "clubs" per gland in the group was estimated. As the mammæ of normal intact weanling males of the Strong A_2G strain bear less than one club per gland (fig. 2, row 1), this figure is taken as being a measure of recently induced growth acceleration and of the "mammotrophic potency" of the stimulus producing it.

Urine and Urinary Extracts

A volume of 0·2 ml. per day per mouse of an untreated early-morning specimen was administered subcutaneously.

Urinary extracts were prepared by a modification of the Lyons method (1934). The dried powder, which keeps indefinitely, was dissolved in a measured volume of normal saline to give a concentration five times greater than urine.

Results

Experiment 1

Neither hormones nor urine was administered to eight hypophysectomised weanlings. Four were killed on the 5th postoperative day, and four on the 10th. Of the forty-five mammary glands examined, all showed obvious atrophic changes, which were already present by the 5th day (fig. 2, row 2.)

Conclusion.—The mammary glands of the weanling male mouse are totally hormone-dependent.

Experiment 2

Œstrone and progesterone were administered to eight hypophysectomised weanlings. In four of these a dose giving an optimal response in the intact animal was injected—i.e., œstrone 0·25 γ and progesterone 1·5 mg. per day per mouse for 5 days. In the remaining four animals this dose was doubled. Forty-four mammary glands were examined, and no sign of a growth response was seen in any.

Conclusion.—The ovarian hormones, œstrone and progesterone, at dose levels which produce a vigorous mammary response in intact Strong A_2G weanlings are powerless to induce any proliferation of mammary epithelium in the hypophysectomised weanling males of this strain.

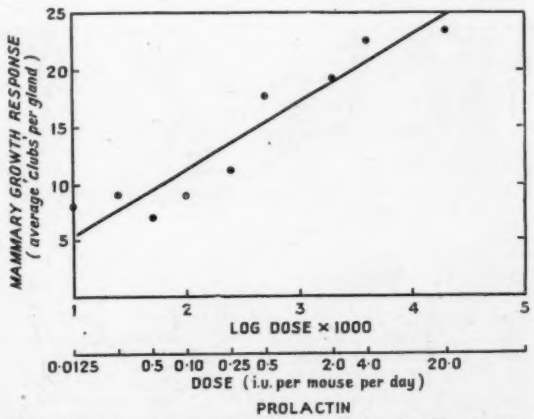


Fig. 1—Dose response curve of mammary growth induced by prolactin (0·0125 to 20 i.u. per day per mouse for five days) in synergism with œstrone and progesterone at constant dose levels.

Experiment 3

Prolactin alone at a dose level which vigorously stimulates mammary growth in the intact weanling (20 international units per day per mouse for 5 days) was administered to five hypophysectomised weanlings. Twenty-three glands were examined. No mammary growth response was seen and in most of the glands there were obvious signs of glandular atrophy.

Conclusion.—Pituitary prolactin alone is not only powerless to stimulate mammary growth in the hypophysectomised weanling male mouse but is incapable of preventing mammary atrophy.

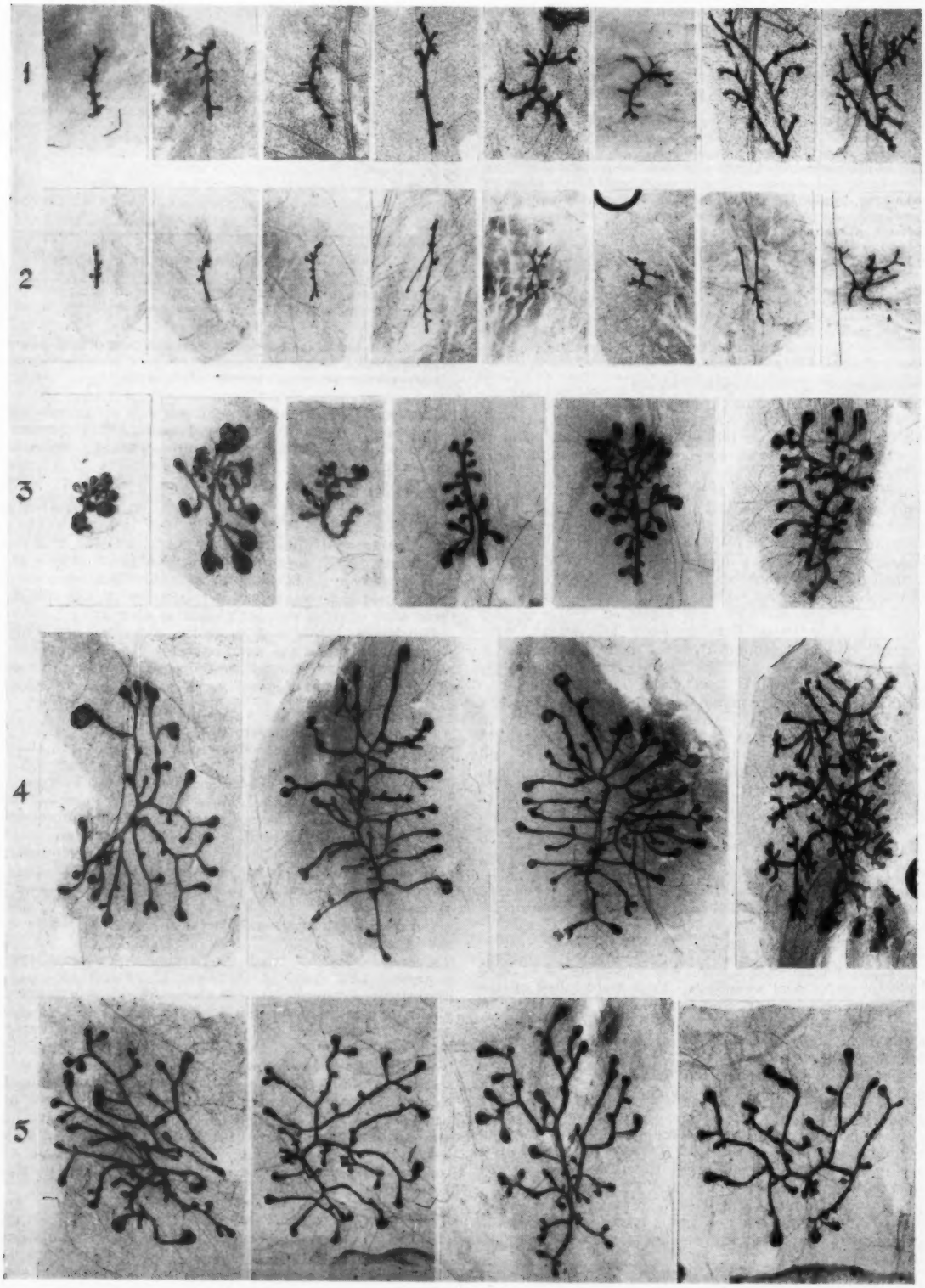
Experiment 4

Œstrone and progesterone together with pituitary prolactin was administered to forty hypophysectomised A_2G weanlings. The dose of prolactin varied from 0·0125 I.U. to 20 I.U. per mouse per day for five days. The dose of ovarian hormones was kept constant at 0·25 γ œstrone and 0·5 mg. progesterone per mouse per day. Two hundred and twenty-eight mammæ were examined. This combination of hormones had induced a vigorous response at all dose levels in all mammary glands in the large majority of animals (fig. 2, rows 3 and 4), and at least 20% of all reacting glands showed early glandular differentiation. The dose response curve is shown in fig. 1.

Conclusion.—The triad of hormones—œstrone, progesterone, and prolactin—is essential for epithelial proliferation and differentiation in the rudimentary mammary glands of the male weanlings of the Strong A_2G strain. As the prolactin used was in all probability contaminated by growth hormone, it is possible that this hormone played a part in the induction of the response; but this seems improbable, for a substantial response was obtained in the mammæ of five animals at the lowest dose-level of prolactin (0·0125 I.U. per day per mouse) when the amount of contaminating growth hormone was probably below its threshold value. Furthermore, in none of these animals was there any increase in weight at the 10th postoperative day.

Experiment 5

Pituitary prolactin was omitted from the combination used in experiment 4, and untreated female urines or urinary extract was substituted for it. Œstrone and progesterone were given at the same dose level as in the


1
2
3
4
5

preceding experiment. Twenty-three hypophysectomised weanlings were used :

Group 1.—Five animals given 0·2 ml. per day per mouse for 5 days of an unextracted early-morning specimen of urine from a normal premenopausal woman collected on the 20th day of the menstrual cycle.

Group 2.—Four animals given the same dose of a pooled specimen from three women at the 21st, 22nd, and 25th days of the menstrual cycle.

Group 3.—Four animals given the same dose of a pooled specimen of postpartum urines collected on the 3rd, 4th, and 5th postpartum days.

Group 4.—Five animals given a urine extract prepared by a modification of the Lyons method (1934) from 1455 ml. of pooled specimens of early-morning urine from a normal premenopausal woman collected on the 15th, 16th, 21st, and 27th days of the menstrual cycle. The solution of this extract in normal saline represented a concentration five times greater than in urine.

Group 5.—Five animals given a urine extract prepared by a modification of the Lyons method (1934) from pooled early-morning specimens of urine collected from eight premenopausal women on the 16th, 19th, 20th, 21st, 22nd, 23rd, and 24th (2) days of the menstrual cycle. The solution of the dried extract in normal saline represented a concentration five times greater than in urine.

A hundred and twenty-three mammary glands were examined. An unequivocal mammary growth response, indistinguishable from that produced in experiment 4 by the mammogenic triad, was induced by all specimens of urine acting in synergism with œstrone and progesterone (fig. 2, row 5.) In the following table the mammotrophic potency of the urine in each group is shown with the approximate amount of prolactin in international units which was found requisite in experiment 4 to induce a mammary response of approximately equal intensity (see fig. 1) :

Group	Mammotrophic potency of urine or extract (average no. of clubs per gland)	Approximate equivalent of prolactin in unextracted urine (I.U. per mouse per day)
1	6	0·016
2	3·5	< 0·01
3	5	0·01
4 (extract)	17·7	1·225
5 (extract)	8	0·04

Conclusion.—The urine of premenopausal women can effectively substitute for the prolactin component of the mammogenic triad and induce significant mammary growth responses in the hypophysectomised male weanling mouse. It is highly improbable that growth hormone plays more than an insignificant part in this reaction.

Discussion

In many ways the weanling male mouse has proved to be an ideal biological test object for the investigation of mammogenesis induced by exogenous stimulation. The experiments reported in this paper, using the hypophysectomised male weanling, implicate pituitary prolactin with a considerable degree of certainty as the mammotrophin present in human female urine. Further investigation is clearly needed to decide if human urine contains any significant quantity of growth hormone. Some of the results obtained by Lyons and his colleagues (1955) suggest that growth hormone plays a part in developing the duct system of the rudimentary mamma of the hypophysectomised immature rat. It is abundantly clear, however, that no combination of hormones which does not include prolactin can bring this rudimentary gland to anything approaching the status of a functionally competent organ. There is no doubt that many specimens of easily available growth hormone are contaminated by prolactin, and, unless very elaborate precautions are taken in their preparation, many commercial preparations of prolactin contain growth hormone in small and possibly insignificant amounts. It seems safe to assume, therefore, that in some of the mammary reactions described in this paper growth hormone may have played a subsidiary part.

Certainly the hypophysectomised mouse is far more sensitive to exogenous prolactin and human urine than the intact animal, and yields more uniform mammary reactions.

It will be necessary to define the nature of the genetic peculiarity in Strong A_2G mice which endows the male weanlings of this strain with their exceptional mammary reactivity to prolactin and human urine. Experiments now nearing completion have shown that the ratio

$$\frac{\text{Testis weight}}{\text{Body weight}}$$

is significantly higher in these animals than in the male weanlings of prolactin-insensitive strains.

If, as a measure of pituitary mammotrophic function, the mouse test proves to be of clinical value in rationalising the treatment of breast cancer by hypophysectomy, the difficulties associated with strain variation could be met by establishing colonies of Strong A_2G mice in centres where hypophysectomy for breast cancer is under investigation.

General Conclusions

1. Experimental evidence is produced supporting the conclusion that human female urine contains pituitary prolactin at concentrations varying from 0·01 to 0·25 international units per millilitre.

2. It is suggested that an estimation of urinary prolactin may materially assist in the selection of those patients with metastatic breast cancer who are likely to benefit from hypophysectomy.

3. It is also suggested that, for the bio-assay of prolactin in human urine, potent urinary extracts (which can be preserved indefinitely) should be injected into hypophysectomised male weanling mice of the Strong A_2G strain.

My warmest thanks are due to Dr. O. Mühlbock, director of the Netherlands Cancer Institute, Amsterdam, for kindly providing facilities for me to learn the technique of hypophysectomy in the mouse, and it gives me much pleasure to express my gratitude to Dr. Kwa Hong Giok, of the same institute, for his invaluable advice, encouragement, and assistance during the investigations.

The urinary extracts were prepared by my colleague, Dr. F. C. Greenwood ; his assistance has been invaluable. I am grateful to Dr. W. F. J. Cuthbertson for arranging supplies of mice from the Glaxo Laboratories, and to Messrs. Armour who kindly gave me the prolactin.

CAPTION TO ILLUSTRATIONS (FACING)

Fig. 2—Photographs of whole-gland mounts (× 10). Mammæ dissected out of "de-fatted" carmine-stained pelt and mounted without sectioning.

Row 1.—*Slowly growing* unclubbed mammæ of intact untreated male weanling.

Row 2.—*Atrophic* mammæ produced by total hypophysectomy. Neither ovarian hormones nor prolactin when given alone can retard this process.

Rows 3 AND 4.—*Rapidly growing* heavily clubbed mammæ of totally hypophysectomised male weanling mice reacting to the "mammogenic triad." Row 3 shows the evolution of the reaction. Row 4 the maximal response after 5 days' treatment. The gland on the extreme right is heavily acinised.

Row 5.—*Rapidly growing* mammæ of totally hypophysectomised animals reacting to the administration of a combination of an extract of human female urine and the ovarian hormones, œstrone and progesterone.

REFERENCES

Hadfield, G., Young, J. S. (1956a) *Brit. J. Cancer*, **10**, 145.
— — (1956b) *Ibid*, p. 324.
Lyons, W. R., Johnson, R. E., Cole, R. D., Li, C. H. (1955) Hypophyseal Growth Hormone, Nature and Actions : International Symposium. New York ; p. 461.
— Page, E. (1934) *Proc. Soc. exp. Biol., N.Y.* **32**, 1049.
Thomas, F. (1938) *Endocrinology* **23**, 99.
Young, J. S. (1957) *Brit. J. Cancer* (in the press).

MUMPS VIRUS AND SUBACUTE THYROIDITIS

EVIDENCE OF A CAUSAL ASSOCIATION

E. EYLAN R. ZMUCKY
M.D., Ph.D.
OF THE A. FELIX LABORATORIES FOR PUBLIC HEALTH, TEL-AVIV

CH. SHEBA
M.D.
OF THE TEL-HASHOMER HOSPITAL, ISRAEL

SUBACUTE thyroiditis has distinctive clinical and pathological features; it can be clearly differentiated on the one hand from acute pyogenic infections of the thyroid, and on the other, from the forms of chronic thyroiditis described by Riedel and by Hashimoto. Its cause is unknown, but the clinical and pathological features are generally admitted to be compatible with infection by an as yet unidentified virus.

Subacute thyroiditis is regarded as rare, but a comparatively large number of cases has been seen in Israel in recent years. This has provided an opportunity for a renewed search for evidence of a causal virus. 14 female patients and 1 male with subacute thyroiditis have been studied from this point of view.

Clinical Features

The illness usually started with mild pyrexia, accompanied by pain radiating from the neck to the ears, particularly noticeable on swallowing. Swelling and tenderness of the thyroid gland, either bilateral or unilateral, appeared a few days later. Tachycardia, sweating, and tendency for the eyes to stare were often seen. A few patients complained of abdominal discomfort, but no abnormal physical signs were found.

In our material the progress of the disease was not left to its natural course; in 11 out of 15 cases corticotrophin or cortisone was administered. The swelling of the thyroid gland disappeared within seventy-two hours after the start of such treatment. The pyrexia usually disappeared within twenty-four hours. In 7 of these cases the pyrexia and painful swelling of the gland recurred after the end of steroid medication. In none of our cases was a lasting swelling or myxœdema recorded.

10 patients were studied by two of our staff (Dr. Harell-Steinberg and Dr. P. Cerniak) for a long time with repeated ^{131}I and protein-bound-iodine (P.B.I.) studies, and, after six months at most, all reverted to euthyroidism; none later developed either permanent hypothyroidism as reported by Keating et al. (1950) or hyperthyroidism as reported by others.

Investigations

A mild polymorph leucocytosis (up to 17,000 per c.mm.) was observed in three-quarters of the cases. The erythrocyte-sedimentation rate was usually raised—above 50 mm. in 1 hour (Westergren) in 11 of 15 cases. The serum-P.B.I. level was above 8 μg. per 100 ml. in 8 of 11 cases in which it was estimated. In contrast the uptake of radio-iodine was greatly reduced in 12 of 15 cases. The combination of a high P.B.I. and low radio-iodine uptake is regarded by most observers as characteristic of subacute thyroiditis.

Histology

Biopsy was performed in 4 cases. Invasion by inflammatory cells was present in all. In 2 cases investigated early in the disease polymorphonuclear cells predominated but lymphocytes predominated in the 2 later cases. There was gross disruption of the normal acinar pattern in all 4 cases. Giant cells were often seen, probably representing the remains of acini which had been destroyed (figs. 1–3).

Complement-fixation Tests against Mumps Virus

Complement-fixation tests were performed by the method of Kolmer and Boerner (1941) using Lederle viral antigen.

The results are shown in table I. Positive results were obtained in 10 of the 11 cases. In the 1 negative case (case 4) the histology of the thyroid was atypical.

Table II shows the results of the complement-fixation tests done long after clinical recovery. The tests probably become negative some eight to ten months after the onset.

Since a very large proportion of the population has had mumps at one time or another, it was necessary

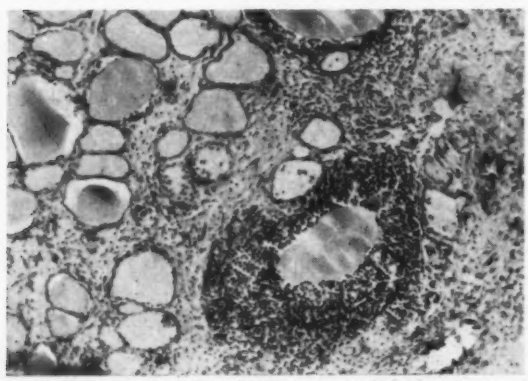


Fig. 1—Subacute thyroiditis showing polymorph infiltration round colloid follicle. (Hæmatoxylin and eosin. × 75.)

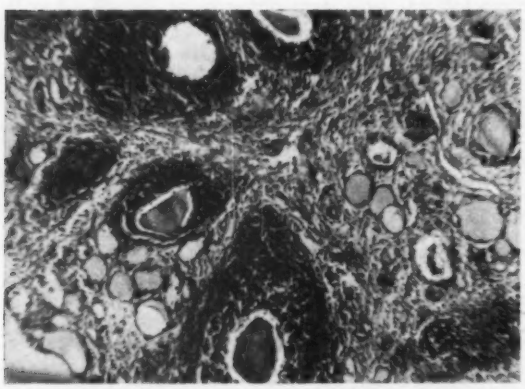


Fig. 2—Subacute thyroiditis showing perifollicular pseudo-abscess. (Hæmatoxylin and eosin. × 75.)

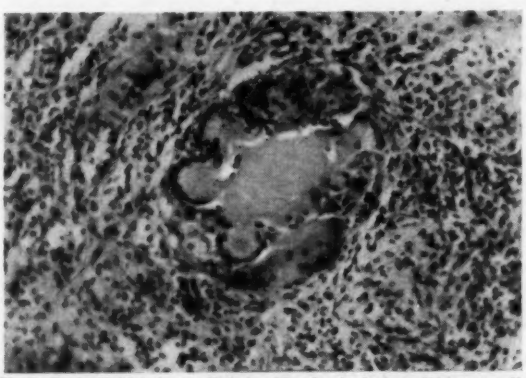


Fig. 3—Pericolloidal giant-cell chain of foreign-body type. (Hæmatoxylin and eosin. × 150.)

to examine numerous controls. Of 52 healthy women, aged 30–64, the complement-fixation tests were negative to mumps in 42, and positive in 6 to a titre of 1 : 10 and in 4 to a titre of 1 : 20.

A further possibility was that the positive complement-fixation tests in subacute thyroiditis represented an anamnestic response in persons previously in contact with mumps virus. Patients with various diseases, including acute fevers, were therefore studied, with the results shown in table III.

From these control studies we concluded that positive complement-fixation tests to a titre of 1 : 80 or more could be taken as evidence of recent contact with mumps virus.

Isolation of a Virus

Attempts to recover a virus from blood and fæces were unsuccessful.

In 2 cases in which biopsy was done a virus was recovered from the excised thyroid gland (cases 1 and 3). The specimens were inoculated intracerebrally into mice and hamsters (newborn and adult) and into the yolk-sacs of 8-day fertilised eggs.

The results of animal inoculation were negative except in the case of the baby hamsters. In a proportion of these animals signs of encephalitis appeared six to nine days after inoculation of the specimens from both patients. It proved possible to passage the infective agent by intracerebral injection into further baby hamsters, both with and without Seitz filtration.

Yolk-sacs were emulsified five days after inoculation and injected into the amniotic sac of 8-day fertilised eggs. After a further five days amniotic fluid was removed and found to agglutinate human group-O red cells. Hæmagglutination was suppressed by the addition of serum from patients convalescent from classical mumps, and by serum from patients with subacute thyroiditis. Serum from healthy female controls did not suppress hæmagglutination or only to an insignificant degree.

TABLE I—COMPLEMENT-FIXATION TESTS AGAINST MUMPS VIRUS IN SUBACUTE THYROIDITIS

Case no.	Age (yr.)	Day of illness	Titre
1	42	6	1 : 40
		24	1 : 160
		45	1 : 160
		128	1 : 160
2	62	7	1 : 40
		22	1 : 160
		62	1 : 160
3	30	33	1 : 160
		53	1 : 40
4	54	6	Negative
		13	Negative
		96	Negative
5	24	9	1 : 40
		22	1 : 160
		223	1 : 80
6	24	9	1 : 80
		22	1 : 80
7	53	6	1 : 80
		20	1 : 80
		53	1 : 40
8	42	4	1 : 80
9	41	14	1 : 160
10	38	8	1 : 40
		18	1 : 160
11	13	30	1 : 80
		45	1 : 80

Discussion

The positive complement-fixation tests obtained in 10 of 11 patients with subacute thyroiditis provide evidence of recent contact with mumps virus. Isolation of a virus from two affected thyroid glands strongly suggests that it was the cause of the observed pathological changes. Specific inhibition of hæmagglutination by convalescent mumps serum establishes the identity of the virus.

The hypothesis that the cases of subacute thyroiditis observed during the present outbreak in Israel were caused by infection with mumps virus is quite compatible with the known clinical and epidemiological facts. This virus has a predilection for glandular tissue (salivary, pancreatic, lacrimal, testicular, mammary, and ovarian). Although concomitant enlargement of salivary and thyroid glands was not observed in our cases, abdominal pains were not uncommon, and in 3 of 6 cases in which it was looked for a rise in blood-diastase above 200 Somogyi units was observed.

During the period when our cases of subacute thyroiditis were discovered the incidence of mumps was particularly high in Israel, the rate per 10,000 having risen from 12 in 1953 to 32 and 44 in 1955 and 1956. In the earlier cases studied a history of contact with mumps was not inquired for, because the possibility of this association had not then occurred to us. Of the later cases, 4 had been in close recent contact with cases of classical mumps.

In putting forward the suggestion that mumps virus may be the cause of subacute thyroiditis it is important to emphasise that our findings apply only to the local outbreak of this disease in Israel. It is quite possible that different ætiological agents are concerned in different places and at different times.

TABLE II—COMPLEMENT-FIXATION TESTS IN PATIENTS AFTER RECOVERY

Case no.	Age (yr.)	Titre during illness	Interval (months)	Titre after recovery
12	40	Not tested	17	Negative
13	50	Not tested	13	Negative
14	36	Not tested	11	Negative
15	24	1 : 160	7½	1 : 80
1	42	1 : 160	4	1 : 160

TABLE III—COMPLEMENT-FIXATION TESTS IN VARIOUS DISEASES

Diagnosis	No. of cases	Titre
Poliomyelitis	2	1 negative, 1 positive 1 : 20
Encephalitis	9	7 negative, 2 positive 1 : 20
Brain abscess	1	1 negative
West Nile fever	3	2 negative, 1 positive 1 : 20
Atypical pneumonia	6	6 negative
Mitral stenosis	2	2 negative
Urticaria	4	4 negative
Thyrotoxicosis	4	4 negative
Thyroid adenoma	1	1 negative
Thyroid cancer	1	1 negative
Hæmorrhagic pancreatitis	2	2 negative
Total	35	31 negative, 4 positive 1 : 20

Summary

An unusually large number of cases of subacute thyroiditis has been seen in Israel in the past two years. The clinical and pathological features of these cases are described.

10 of 11 cases had positive complement-fixation tests against mumps virus to a significant titre.

A virus thought to be identical with mumps virus was isolated from the thyroid glands of 2 patients with subacute thyroiditis.

It is suggested that mumps virus was the cause of the thyroiditis in these patients.

REFERENCES

Keating, F. R. jun., Haines, S. F., Power, M. H., Williams, M. M. D. (1950) *J. clin. Endocrin.* **10**, 1425.

Kolmer, J. A., Boerner, F. (1941) Approved Laboratory Technic. New York.

BENIGN GASTRIC ULCER

RISK OF COMPLICATION IN RELATION TO SITE

EDDY D. PALMER
M.D. Rochester
LIEUT.-COLONEL, MEDICAL CORPS, U.S. ARMY
From the Medical Service, 2nd U.S. Army General Hospital, Landstuhl/Pfalz, Germany

THE complication-rate of benign gastric ulcers, including those which are under treatment, is high, and the complications of gastric ulcer are less predictable than those of duodenal ulcer. Although few surgeons now believe that all gastric ulcers should be cut out because they might be cancerous, gastrectomy remains good treatment for certain benign ulcers. Whether it is advisable depends largely on a history of complications in the past and a guess as to their likelihood in the future.

To determine the risk of complications of ulcers in various parts of the stomach, I have reviewed the records of 250 personally observed patients with gastric ulcer. The ages of the patients at the time of diagnosis ranged from 16 to 88, 62% being between 20 and 50. The diagnosis was established röntgenologically in 245, gastroscopically in 238, and by operation or necropsy in 84. 12 patients had two ulcers, 5 had three, and 4 had five, making a total of 288 ulcers. The average length of ulcer illness covered by this report was 45·1 months, and the average length of controlled therapy 16·4 months. 38 of the patients first came to medical attention because of a complication; therefore, there was a misleading concentration of complications during the observation period.

Among 109 patients there were 115 complications (see table), 6 patients having both hæmorrhage and perforation. (In view of the high rate of complications observed, it is interesting that double complications were no commoner.) There were totals of 77 instances of hæmorrhage, 18 of perforation, 10 of penetration, and 10 of obstruction. 4 of the penetrations involved the pancreas, 4 the lesser omentum, and 2 the liver.

The proportion of ulcers giving rise to complications was highest in the distal part of the stomach and lowest in the proximal, decreasing progressively (53% in the pylorus, 42% in the antrum, 37% in the pars media, and 28% in the cardia and fundus). Also it was found that ulcers of the anterior wall—omitting pyloric ulcers—were far more prone to complication (63%) than those of the lesser curvature (37%), posterior wall (35%), or greater curvature (33%).

Analysis according to the type of complication shows that, with one or two exceptions, apparently governed by the small numbers of cases represented, the risk of hæmorrhage was approximately the same for ulcers in all parts of the stomach. Perforation, on the other hand, was far commoner among anterior-wall ulcers, and (surprisingly enough) only 20% of the cases of penetration involved posterior-wall ulcers. Obstruction, as one might expect, was always caused by distal ulcers, except in one case where constriction across the pars media produced enough hour-glass constriction to obstruct.

288 BENIGN GASTRIC ULCERS (250 PATIENTS). COMPLICATIONS IN RELATION TO SITE WITHIN THE STOMACH

Site	No. of ulcers	Complications (%)			
		Hæmorrhage	Perforation	Penetration	Obstruction
Pylorus	17	29	0	0	24
Antrum :					
Lesser curvature	79	28	6	1	3
Greater curvature	18	22	6	6	6
Anterior wall ..	19	21	32	11	11
Posterior wall ..	30	30	0	3	0
Pars media :					
Lesser curvature	81	26	2	5	1
Greater curvature	5	20	0	0	0
Anterior wall ..	9	33	22	0	0
Posterior wall ..	12	25	17	8	0
Cardia and fundus :					
Lesser curvature	9	44	0	0	0
Greater curvature	1	0	0	0	0
Anterior wall ..	2	0	0	0	0
Posterior wall ..	6	17	0	0	0

ASTHMATIC WHEEZING

COMPRESSION OF THE TRACHEA AND MAJOR BRONCHI AS A CAUSE

E. DEKKER M.D. Amsterdam
J. GROEN M.D. Amsterdam
From the Second Medical Service of the Wilhelmina-Gasthuis, Amsterdam

IT is commonly assumed that the typical wheezing during the expiratory phase of the asthmatic attack is produced by a stenosis of the smaller bronchi and bronchioli. Opinions differ about the cause of this stenosis. Some attribute it to spasm of the bronchial and bronchiolar musculature; others to a partial obstruction by mucus, or œdema and congestion of the bronchial mucosa, or both. In this paper we present evidence for another explanation of asthmatic wheezing —namely, that it may be produced, at least partly, by a narrowing of the trachea and larger bronchi.

We have already described how typical asthmatic attacks were produced and reproduced under controlled laboratory conditions by exposing patients to allergic or emotional stimuli (Dekker and Groen 1956). These experimentally provoked attacks could begin so suddenly that doubt was cast on the common assumption that spasm in smooth muscle or secretion of mucus were responsible. A similarly sudden onset and disappearance of the wheeze is commonly seen in clinical practice—e.g., when a patient relates his history. This made us doubt the validity of the hypothesis that the wheezing is produced by a mechanism involving the autonomic nervous system, and led us to seek another explanation.

Talma (1898a and b) and Strübing (1906) emphasised two points that seem to have been overlooked by most modern authors:

(1) The sound heard is exactly identical when the stethoscope is applied to different places on both sides of the thorax and over the trachea. This must mean that the typical wheezing is not produced by multiple local stenoses of the smaller air-passages but by a centrally situated narrowing of the trachea or of the major bronchi, whence it is conducted over the entire thorax. This narrowing was indeed observed by Van Hoek (cited by Talma 1898a and b), an assistant of Zwaardemaker, and later by Talma (1898a and b) himself through the laryngoscope.

(2) Many asthmatics, when asked to demonstrate "how it wheezes" during an attack can produce audible wheezing at will. Normal people can also learn to do this. This suggests that the wheezing (i.e., the stenosis of the upper respiratory passages) can be produced by a *voluntary* effort.

Following this line of thought, we have asked ourselves whether this voluntary effort could be mediated through the positive pressure created in the thorax by the powerful contraction of the abdominal, thoracic, and cervical musculature during the typical "asthmatic" expiration. During such an expiration the contents of the thorax are compressed by a pressure which is many times higher than normal and high enough to narrow the trachea and the larger bronchi to a considerable degree. In the trachea and main bronchi this compression is chiefly caused by the membranaceous part of the wall being pressed into the lumen. This has already been suggested, though in somewhat different terms

(Biermer 1870, Einthoven 1892, Sahli 1920). It has been clearly observed by many investigators through the bronchoscope (Von Sehrötter 1906, Brünings 1910, Keiper 1914, Lukens 1925, Moore 1925, Daily and Daily 1929, Clerf 1935, Van Loon and Diamond 1942, Lell 1946, Lemoine 1949, Waldbott 1949, Turiaf et al. 1952, Lemoine and Garaix 1953, Herzog 1954, Howell 1955, Wyss 1955) and by other authors by bronchography (Di Rienzo 1949a and b, 1953, Stutz 1952, Van Exter 1953), but the possibility that the compression could be the origin of the wheeze, and contribute to the dyspnœa, has not received the attention it deserves.

Investigations in Vivo

Healthy people and asthmatic patients were taught to "wheeze." We followed the method indicated by Strübing (1906) to teach wheezing. After a short inspiration, a short cough is followed by a prolonged forceful "pressing" expiration. Gradually the closure of the glottis, preceding the cough, is omitted and the pressing expirations continued. The best results are obtained when the investigator first learns to wheeze himself, and then demonstrates the technique to the subjects. Of 17 healthy subjects in whom we tried this manœuvre, 15 were able to imitate the wheeze after a few trials. In some of them the resemblance between this artificially induced wheezing and the spontaneous wheeze during the asthmatic attack was most striking. Asthma patients similarly learned to wheeze at will and in them the resemblance to the spontaneous wheeze was even more obvious.

a *b*

Fig. 2—Radiographs of larynx and trachea (asthmatic patient): (*a*) during inspiration; (*b*) during voluntary wheezing expiration.

a *b*

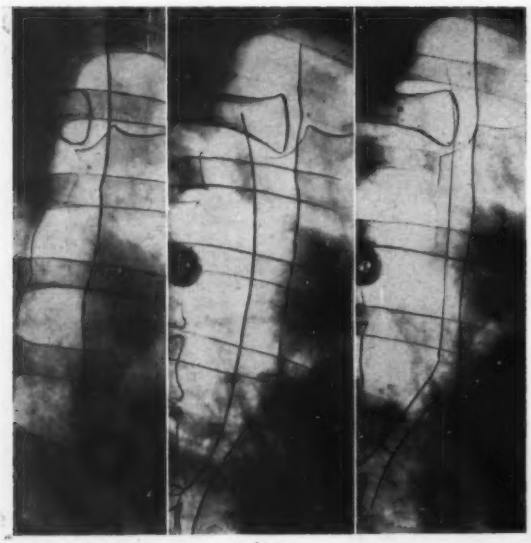
Fig. 1—Radiographs of larynx and trachea (normal subject): (*a*) during inspiration (*b*) during voluntary wheezing expiration.

The second part of the investigations was radiological. Frontal, transverse, and oblique short-time exposures were made of the dynamic changes in diameter of the trachea and the main bronchi during inspiration and during a voluntary wheezing expiration, in healthy subjects and in asthmatic patients. Similar studies were done on asthmatic patients during spontaneous attacks.*

Results

During voluntarily induced "asthmatic" expiration in a normal subject, narrowing of the lumen of the trachea was seen to extend into the lower part of the cervical trachea (fig. 1). In our opinion this is due to the propagation of positive pressure inside the cone of cervical musculature (on the anteroposterior exposures it could be seen that the glottis was open during voluntary wheezing expiration).

* These investigations were carried out in coöperation with Dr. R. C. Ledeboer in the university department of röntgenology, under the direction of Prof. Dr. B. G. Ziedses des Plantes; they will be published more extensively elsewhere.



a *b* *c*

Fig. 3—Right oblique radiographs of trachea and main bronchi (emphysematous asthmatic patient) during an attack of dyspnœa (outlines drawn): (*a*) during inspiration; (*b*) during expiration; (*c*) during voluntary wheezing expiration.

An equally considerable narrowing of the main airways was seen during voluntary wheezing expirations in patients with asthma and emphysema (figs. 2*b*, 3*c*, 4*c*). The extent and situation of the tracheo-bronchial constriction were strikingly similar to those seen in the normal subjects.

Exactly the same type of narrowing of the cervical and thoracic trachea and the major bronchi was found during normal expiration in a patient with emphysema (fig. 3*b*) and a patient with asthma (fig. 4*b*) during severe spontaneous attacks of dyspnœa.

Experiments in Vitro

The above experiments, together with the demonstration *ad oculos* of the narrowing of the trachea and main bronchi by bronchoscopy and bronchography, do not yet answer the question whether this narrowing is caused by active constriction (e.g., by spasm of the tracheal and bronchial musculature), or is a result of a purely passive compression by the increased thoracic pressure during forceful prolonged expiration. To investigate this we used a human lung obtained at necropsy.† The preparation was put in a glass jar that could be closed by a brass lid. The trachea was tied over a glass cannula that pierced the lid and thus connected the trachea and bronchi with the outside air. By another opening in the lid, air could be pumped in and out of the jar, about 20 times a minute (fig. 5). The inspiratory and expiratory pressures of this "respiration" could be varied and measured by a manometer. When the lung "breathed" under a pressure comparable to the physiological pressures in the thorax (i.e., a negative pressure of about 1 cm. Hg during inspiration and atmospheric pressure during expiration) a slight widening of the trachea during inspiration was observed, but there was no compression during expiration. But when the expiratory pressure inside the jar was increased to 1 cm. Hg or more, prolapse of the membranaceous part of the trachea and the main bronchus into the lumen was clearly visible, causing considerable narrowing. This prolapse started early in the expiration (fig. 5).

For the study of the "breath sounds" of this preparation, agonal œdema fluid or bronchial exudate were evacuated by suction. When the main air-passages were dry, a piece of rubber tubing, attached to a stethoscope was introduced into the tracheal cannula. No wheeze was heard when the lung expired under atmospheric pressure; but when the expiratory pressure in the jar was increased to 2 cm. a high-pitched wheeze became clearly audible through the stethoscope.

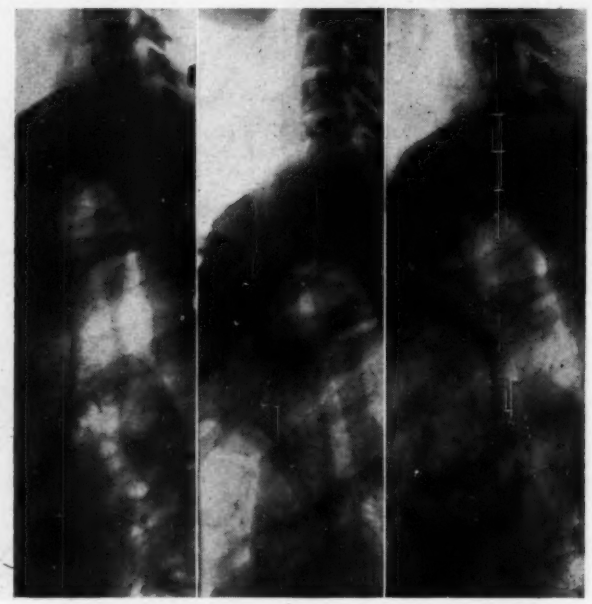
Positive pressures of 1–2 cm. Hg (14–27 cm. of water) are easily produced in vivo during forced expiration; much higher intrathoracic pressures have been measured directly or through œsophageal catheters during expiration in asthmatic attacks (Dayman 1951, Fry et al. 1954, Mead et al. 1955, Wyss 1955). Thus a passive compression, comparable to that in these experiments in vitro, may reasonably be supposed to take place in vivo.

In the living subject the posterior wall of the trachea is attached to the anterior wall of the œsophagus, but this does not prevent its being pushed forward during the expiration, as shown by the aforementioned observations. In fact, physiological experiments (Buytendijk 1949) have shown that the walls of the œsophagus behave so passively that the pressure in its lumen can reliably be used for the determination of intrathoracic pressure.

Discussion

These investigations seem to support the hypothesis that high intrathoracic pressure (produced by asthmatic patients during the peculiar forceful expiration which is part of the characteristic breathing pattern in this disease) causes a passive compression in the larger air-passages which will lead to increased air-flow resistance and should seriously be considered as a cause of asthmatic wheezing.

Our observations as yet do not indicate how far down into the intrapulmonary airways this compression



a *b* *c*

Fig. 4—Left anterior oblique radiographs of trachea and main bronchi (asthmatic patient): (*a*) during inspiration; (*b*) during expiration in a severe attack of asthma; (*c*) during voluntary wheezing expiration.

† We are indebted to Prof. Dr. H. T. Deelman and his staff for providing us with this material.

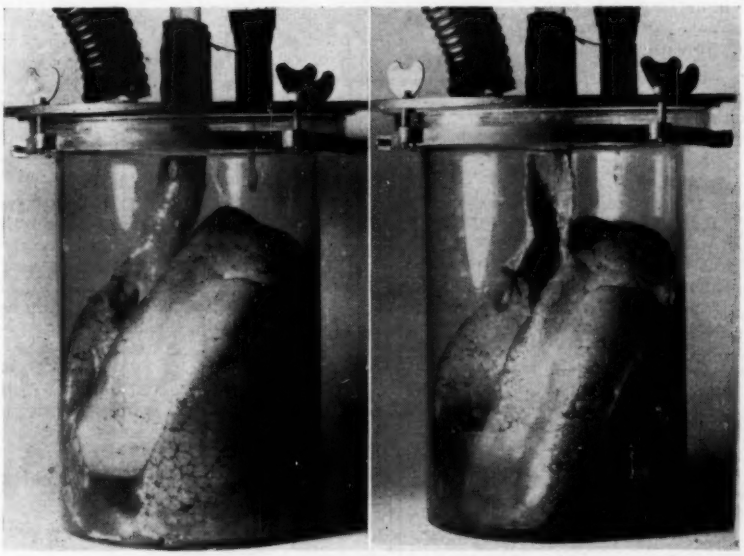


Fig. 5—Isolated human lung, "breathing" in a closed jar: (a) mid-inspiration, trachea wide open; (b) mid-expiration under positive pressure (2 cm. Hg), trachea narrowed by impression of posterior wall into lumen.

extends. It is obvious that the high intrathoracic pressure during expiration compresses not only the trachea and major bronchi but also the intrapulmonary air-passages, because the intrathoracic pressure is transmitted through the pulmonary tissue. At least three forces, however, oppose this compression:

(1) The rigidity of the walls of the bronchi and bronchioli.

(2) The centrifugal dilating forces of the pulmonary tissue, depending on the state of inflation of the lung (Sonne 1923, Von Neergaard and Wirz 1927, Huizinga 1938, Stutz 1949, Van Exter 1953).

(3) The intraluminal air-pressure in the bronchi.

The rigidity of the tracheo-bronchial tree is commonly overestimated. This has led some to assume that the so-called check-valve mechanism is localised only or predominantly in the unsupported bronchioles (Dayman 1951, Fry et al. 1954). Others have been so impressed by the tracheo-bronchial collapse observed either through the bronchoscope (Lemoine 1949, Lemoine and Garaix 1953, Herzog 1954) or by radiology (Pohl 1951, Herzog 1954), that abnormal flexibility of the walls was held to be the primary cause of the phenomenon. Even a plastic operation has been developed for this condition (Nissen 1954). But in those cases where abnormal laxity of the walls really existed the sequence of events might well be reversed. Abnormal flexibility might result from the continuous overstressing of the elastic elements in the walls during the continuous compression with each expiration.

Emphysema will lead to loss of the centrifugally dilating forces (Dayman 1951, Fry et al. 1954), thus facilitating the compression.

The intrabronchial pressure in the cartilage-supported airways would be decreased by any stenosis in the small peripheral bronchi. This might be caused by mucus, congestion of the mucous membrane, or increased muscle-tone. Decreased intraluminal pressure in the bronchi leaves the compressing forces unbalanced. Thus bronchiolar stenosis contributes to the expiratory compression of the larger airways. A primary increase of peripheral resistance, however, is not indispensable for the wheezing by passive compression, as is shown by our experiments with normal individuals.

On the other hand, any increased resistance downstream will increase the intraluminal air-pressure, thus supporting the walls. Barach and Swenson (1939) emphasised the importance of this mechanism in positive-pressure breathing and pursed-lip breathing in the treatment of patients with asthma and emphysema. We can confirm their observation that pursed-lip breathing may momentarily stop the wheeze in these patients.

There is as yet insufficient evidence for a statement on the relative importance of the contribution of the cartilage-supported air-ways and the bronchioles in the production of asthmatic wheezing. Some of the finer wheezing heard over the thorax through the stethoscope may originate in the bronchioles; but we feel that the majority of wheezing sounds which can be heard from the patient's mouth at a distance are produced in the larger, cartilage-supported, airways. Tubes with a bore of less than 1 mm. are poor conductors of sound, especially in the higher frequency ranges (Martini and Müller 1924, Rappaport and Sprague 1951). On the other hand, it is common experience to bronchoscopists that a foreign body in the larger airways produces wheezing indistinguishable from asthmatic wheezing (Jackson 1921, Clerf 1935, Lell 1946).

The influence of the "voluntary" respiration muscles on the diameter, flow resistance, and wheezing of the cartilage-supported airways opens interesting possibilities for the explanation of increased outflow resistance (Von Neergaard and Wirz 1927, Dayman 1951, Fry et al. 1954, Wyss 1955), the pathways of emotional influences (Groen and Bastiaans 1953, Bastiaans and Groen 1955, Dekker and Groen 1956), and the results of breathing and posture exercises (Saenger 1904, Heckscher 1936, Howell 1955) in asthma.

Summary

We have confirmed old observations that asthmatic patients and normal people can learn to wheeze at will by imitating the typical asthmatic expiration. This voluntarily produced wheezing is indistinguishable from the spontaneous wheezing during asthmatic attacks. X-ray studies during this voluntary wheezing reveal, both in normal subjects and in asthmatic patients, a considerable narrowing of the cervical and thoracic trachea and of the main bronchi. The same narrowing was found in X-ray pictures taken during the expiration in patients with spontaneous asthmatic attacks. In human lungs, obtained at necropsy, which were made to breathe under different pressures in a closed jar, an expiratory pressure of 1 cm. Hg or more produced a considerable stenosis by a prolapse of the membranaceous part of the trachea and main bronchi into the lumen. It is postulated that a similar passive compression of the larger air-passages, caused by the high intrathoracic expiratory pressure which asthmatic patients produce as a result of their peculair type of breathing, is an important factor in the production of the asthmatic bronchostenosis and of the expiratory wheezing which is so characteristic of this disease. The importance is

noted of these observations for understanding the mechanisms by which asthmatic attacks are brought about and by which they can disappear with breathing exercises.

This work was supported by grants from the Rockefeller Foundation and the health organisation of the Netherlands Foundation for Applied Scientific Research.

REFERENCES

Barach, A. L., Swenson, P. (1939) *Arch. intern. Med.* **63**, 946.
Bastiaans, J., Groen, J. (1955) *In* O'Neill's Modern Trends in Psychosomatic Medicine. London; p. 253.
Biermer, A. (1870) *Samml. klin. Vortr.* **12**, 39, 44.
Brünings, W. (1910) Die direkte Laryngoskopie, Bronchoskopie und Oesophagoskopie. Wiesbaden.
Buytendijk, H. J. (1949) Oesophagusdruk en Longelasticiteit. Groningen.
Clerf, L. H. (1935) *Ann. intern. Med.* **9**, 1050.
Daily, L., Daily, R. K. (1929) *Laryngoscope, St. Louis*, **39**, 304.
Dayman, J. (1951) *J. clin. Invest.* **30**, 1175.
Dekker, E. Groen, J. (1956) *J. Psychosomat. Res.* **1**, 58.
Di Rienzo, S. (1949a) Radiologic Exploration of the Bronchus. Springfield, Ill.
— (1949b) *Radiology*, **53**, 168.
— (1953) *Fortschr. Röntgenstrahlen*, **78**, 1.
Einthoven, W. (1892) *Pflüg. Arch. ges. Physiol.* **51**, 367.
Fry, D. L., Ebert, R. V., Stead, W. W., Brown, C. C. (1954) *Amer. J. Med.* **16**, 80.
Groen, J., Bastiaans, J. (1953) Psyche en Allergische Ziekten. Leiden; p. 43.
Heckscher, J. (1936) Emphysema and Asthma. Copenhagen.
Herzog, H. (1954) *Schweiz. med. Wschr.* **84**, 217.
Howell, J. D. (1955) *Ann. Allergy*, **13**, 385.
Huizinga, E. (1938) *Acta otolaryng., Stockh.* **26**, 182.
Jackson, C. (1921) *Med. Clin. N. Amer.* **5**, 637.
Kelper, G. F. (1914) *Ann. Otol., &c., St. Louis*, **23**, 53.
Lell, W. A. (1946) *Arch. Otolaryng., Chicago*, **43**, 49.
Lemoine, J. M. (1949) *Sem. Hôp. Paris*, **25**, 3984.
— Garaix, J. P. (1953) *Ibid.* **29**, 933.
Lukens, R. M. (1925) *Laryngoscope, St. Louis*, **35**, 227.
Martini, P., Müller, H. (1924) *Disch. Arch. klin. Med.* **143**, 159.
Mead, J., Lindgren, J., Gaensler, E. A. (1955) *J. clin. Invest.* **34**, 1005.
Moore, W. F. (1925) *Amer. J. med. Sci.* **169**, 799
Nissen, R. (1954) *Schweiz. med. Wschr.* **84**, 219.
Pohl, R. (1951) *Fortschr. Röntgenstr.* **74**, 40.
Rappaport, M. B., Sprague, H. B. (1951) *Amer. Heart J.* **42**, 605.
Saenger, M. (1904) *Münch. med. Wschr.* **51**, 335.
Sahli, H. (1920) Lehrbuch klinischer Untersuchungsmethoden. Bern; part i, p. 61.
Sonne, C. (1923) *Acta med. scand.* **58**, 313.
Strübing, P. (1906) *Disch. med. Wschr.* **32**, 1252.
Stutz, E. (1949) *Fortschr. Röntgenstr.* **72**, 129.
— (1952) *Z. klin. Med.* **149**, 405.
Talma, S. (1898a) *Berl. klin. Wschr.* **35**, 1141.
— (1898b) *Ned. Tidjschr. Geneesk*, **42**, 390.
Turiaf, J., Rose, Y., Marland, P. (1952) *Sem. Hôp.* Paris, **28**, 2984.
Van Exter, P. (1953) Het Bronchographisch Onderzoek bij Asthma Patiënten. Amsterdam.
Van Loon, E. L., Diamond, S. (1942) *Amer. J. Dis. Child.* **63**, 217.
Von Neergaard, K., Wirz, K. (1927) *Z. klin. Med.* **105**, 51.
Von Schrötter, H. (1906) Klinik der Bronchoskopie. Jena.
Waldbott, G. L. (1949) *J. Allergy*, **20**, 335.
Wyss, F. (1955) Asthma Bronchiale. Stuttgart.

A METHOD OF MEASURING THE pH OF BODY-FLUIDS

VICTOR WYNN
M.D. Melb.
SENIOR LECTURER IN SURGERY

JOHN LUDBROOK
M.B., B.Med.Sc. N.Z.*
RESEARCH ASSISTANT, SURGICAL UNIT

ST. MARY'S HOSPITAL, LONDON

THE method described here is especially suitable for measuring the pH of small amounts (about 0·5 ml.) of blood. The apparatus is simple to use and to maintain and is designed for continuous operation; so there is a delay of only about 5 minutes between blood reaching the laboratory and the measurement of its pH. The standard deviation for the reproducibility of pH measurement of blood is 0·005 pH units, which is well within the limits necessary for clinical work.

Apparatus

Constant-temperature pH Cell (fig. 1)

A is the glass electrode with a bulb-type membrane and ground-glass cone (size B7) fitting into the socket in the neck of the anaerobic chamber (B). The chamber is of 0·4 ml. capacity and leads by a capillary about 0·5 mm. in diameter to a hollow-key one-way stopcock (C). The barrel of the stopcock has a glass back to prevent fluid and electrical leakage. The hollow key is pierced at either end to allow air to escape when the key is inserted into the barrel. A little petroleum jelly is applied to the wide end of the key and to the narrow end of the barrel. Thus, when the key is inserted into the barrel and rotated, a layer of grease is formed at each end of the stopcock, leaving a clear ring between, around which the KCl forms a conducting path. Silicone grease should not be used, because it may interrupt the conducting path. The lower opening of the stopcock leads to the reservoir (D) containing 3·5 *M* KCl and the calomel half-cell (E), which is of the conventional 3·5 *M* KCl type. Glass collars are fused to the top of the vessels containing the glass and calomel electrodes to provide a moat between them and the water-bath. This moat is kept clean and dry to prevent electrical leakage.

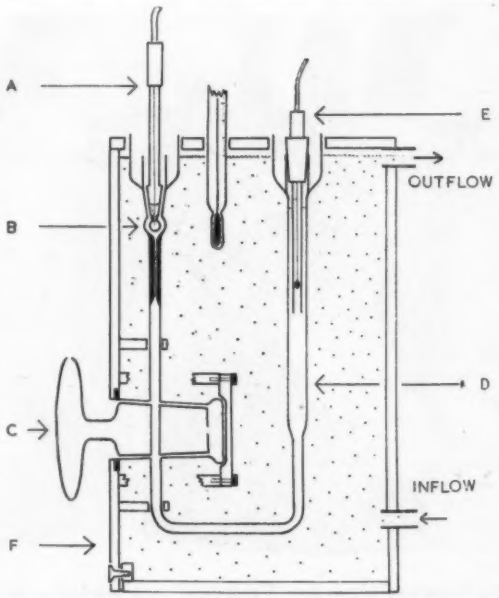


Fig. 1—Constant-temperature pH cell: A, glass electrode; B, anaerobic chamber; C, stopcock; D, reservoir for 3·5 M KCl; E, calomel electrode; F, perspex box with removable front. Inflow and outflow ducts are connected to recirculating pump and thermostatically controlled water-bath.

The whole of this glassware is fitted to the detachable front of a 'Perspex' box (F). The box is surrounded by electrostatic shielding and contains water maintained at 38·0 ± 0·1°C by a thermostatically controlled reservoir water-bath and a recirculating pump capable of exchanging the volume of the box every 2 minutes.

A thermometer, whose bulb is near the glass-electrode chamber, is graduated in tenths of a degree C. There is a duplicate chamber to B connected to a distilled-water reservoir, in which the glass electrode is stored at 38°C ready for use.

Glass Electrode

This consists of a thin bulb of MacInnes-Dole glass fused to the stem just below the ground-glass cone. It is of the standard Ag/AgCl/0·1*M* HCl type with shielded input lead. It is mechanically robust and, in our experience, gives constant response for at least nine months.

Measuring Apparatus

This is a direct-reading millivoltmeter based upon the dynamic capacitor with full-scale deflections of 10, 30,

* N.Z. University Travelling Scholar.

100, 300, and 1000 mV. The effect of variations in mains voltage is negligible, and the apparatus may be left running continuously. In series with the low-resistance input from the calomel electrode is a potentiometer (fig. 2). By means of this a steady back E.M.F. is applied which is adjusted to enable the full length of the appropriate scale to be used for the pH determination.

Buffer Solutions

The buffers used and the pH values assigned to them are those described by Hitchcock and Taylor (1938) and recommended by the British Standards Institute (specification 1647 : 1950). These give virtually the same pH scale as that recommended by the U.S. National Bureau of Standards (L.C. 993 : 1950). They are 0·05 *M* potassium hydrogen phthalate (pH 4·025 at 38°C), a mixture containing 0·025 *M* disodium hydrogen phosphate and 0·025 *M* potassium dihydrogen phosphate (pH 6·835 at 38°C), and 0·05 *M* disodium tetraborate decahydrate (pH 9·070 at 38°C). They are easy to make up and, if a crystal of thymol is added, the former two remain stable for at least two months, the latter for a shorter period.

The buffers are prepared by dissolving the proper weight of 'Analar' reagent-grade salt in reboiled distilled water of pH 6·7–7·3 and making up to one litre in a volumetric flask. Before being weighed, the potassium hydrogen phthalate and the phosphate salts are dried in an oven at 110°C for two hours and cooled in a desiccator. Disodium tetraborate decahydrate is dried without heating in a desiccator for forty-eight hours. These buffers have a high buffering capacity and a low dilution effect. Buffers of intermediate value to those described here have not these properties, and we have found that commercially made intermediate buffers designed to have a pH nearer to that of blood soon change from their nominal pH values.

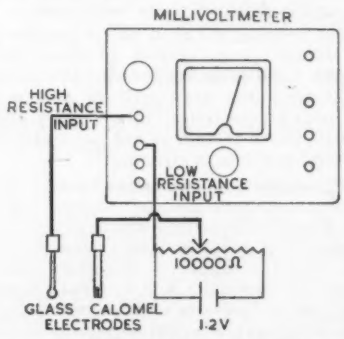


Fig. 2—Simple potentiometer to be used in conjunction with millivoltmeter.

Technique of Measuring Blood pH

The chamber (fig. 1,B) is filled and sucked out several times with distilled water and finally with A.R. acetone to dry the chamber. The stopcock is opened to allow the KCl just to reach the top of the capillary, then closed. It is important not to allow KCl to enter the chamber; otherwise significant depression of the pH of the buffer will result owing to a salt effect, and reproducibility will be affected. pH 6·835 buffer (a sample of which is kept in the reservoir water-bath) is introduced. The glass electrode is lightly dried with filter-paper and inserted. The millivoltmeter is switched on to the 100 mV scale. After three minutes the potentiometer is adjusted until the millivoltmeter reads between 0 and 10 mV, and an accurate reading is taken. On this scale the meter may be read to ±0·1 mV (±0·002 pH units). The buffer is then sucked out and the chamber washed with distilled water and dried with acetone. The glass electrode is washed and stored in distilled water in the duplicate chamber. The KCl liquid junction is now renewed. The glass electrode is withdrawn and dried with filter-paper. Blood is introduced into the chamber from a syringe with a long needle, which reaches to the bottom of the chamber. The glass electrode is immediately inserted, and an accurate reading is taken at $1^1/_2$ minutes. The difference in mV multiplied by 0·0162 gives the pH difference between buffer and blood. The figure 0·0162 is the theoretical factor relating pH to mV; it is derived from the expression $F/0{\cdot}0023026\,RT$, where R is the gas constant, F the faraday, and T the absolute temperature. In our experience the electrodes may not give exactly this response; so, for more accurate work, we allow for this error and any others inherent in the method by calibrating the glass electrode with the pH 4·025, pH 6·835, and pH 9·070 buffers. We have found the response linear over this pH range, and in terms of the conversion factor from mV to pH units this response has remained constant within 0·00005 for any one electrode for at least three months.

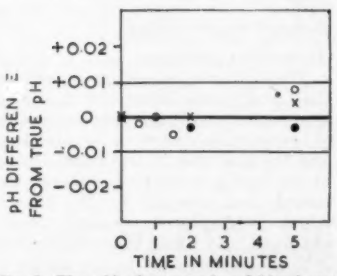


Fig. 3—The pH of a sample of blood was measured in the usual way as described in the text. The measurements were repeated after various times of exposure in chamber before electrode was inserted. Experiment was repeated thrice. Horizontal lines are true pH ± 2S.D.

The factor has varied from one glass electrode to another within the range 0·0163 to 0·0165. A glass electrode should be checked periodically by this method.

Other biological fluids.—The pH of other biological fluids may be measured by an exactly similar method using the scale of the millivoltmeter appropriate to the pH range.

Some Factors Affecting Measurement of Blood pH

Collection and Storage of Blood

Blood is collected without bubbles into a paraffined or silicone-greased syringe containing 0·04 ml. (0·2 mg.) of heparin per 10 ml. of blood. The needle is inserted into a cork until pH is measured. Since electrolyte estimations are generally to be made on the same sample, fluoride is not added. Moreover it is unnecessary because, under these conditions, there is no change in the blood pH at room-temperature for at least 30 minutes. If the syringe is placed immediately into iced water, there is no change

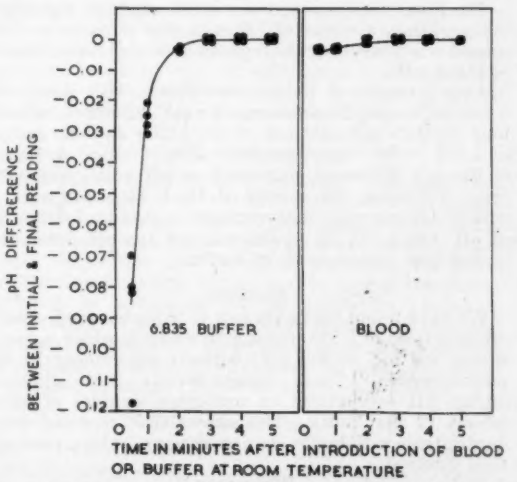


Fig. 4—Effect of time, after introduction of the sample and glass electrode into chamber, on pH of sample. Experiment was performed four times and measurements were made at 38°C.

for four hours (Astrup 1956, Severinghaus et al. 1956, and personal observations).

Anaerobic Conditions

The best way to ensure anaerobic conditions is to send the blood to the laboratory in the syringe. Blood comes into contact with the atmosphere only in the brief period (a few seconds) between its introduction into the chamber and the insertion of the glass electrode. In any case, the blood finally in contact with the electrode has been protected from the air by the blood initially introduced, which is displaced upwards from the bottom of the chamber. By filling the chamber with blood and allowing it to remain exposed to the air for varying periods before the electrode is introduced, it can be shown that no significant pH change attributable to loss of carbon dioxide can be detected with up to 5 minutes' exposure (fig. 3).

Equilibration Time

When buffer is introduced at room-temperature, a steady reading is reached after 3 minutes, this being the time taken to reach thermal equilibrium. When blood is introduced, however, the time taken to reach a steady reading is less—about $1^1/_2$ minutes (fig. 4). This is because the negative temperature coefficient of the pH of blood almost cancels out the positive coefficient of the E.M.F.–pH relationship of this particular cell system.

Since the mV reading with blood remains constant for at least a further 3 minutes after equilibrium is reached, one may assume that the blood pH read after $1^1/_2$ minutes has not been measurably affected by glycolysis.

Reproducibility

The reproducibility of the measurement of the pH difference between two buffers with a pH difference similar to that between 6·835 buffer and blood was tested in the following way:

A buffer of mean measured pH 7·273 was made up, and the mV difference between this buffer and one sample of 6·835 buffer was measured nine times. The standard deviation of the mV differences, expressed in pH units, was 0·0025 (S_1).

A similar experiment was made with a sample of blood transferred anaerobically from a 20-ml. syringe to nine 2-ml. syringes, which were stored in iced water till the pH determination was made. The mean value for pH of the blood was 7·332. The mV difference between one sample of 6·835 buffer and each aliquot of blood was measured. The standard deviation of the mV difference expressed in pH units was 0·005.

The first experiment gives a measure of the reproducibility of measurement of pH with this apparatus. The second is a measure of the reproducibility of measurement of blood pH.

As a measure of the reproducibility with which pH 6·835 buffer may be made up, the mV difference between nine separate preparations of this buffer and one sample of 7·273 buffer was measured. The standard deviation of the mV difference, expressed as pH units, was 0·005 (S_2). By using the results of the first experiment to correct for errors in measurement, a standard deviation of pH ·004 ($\sqrt{S_2^2-S_1^2}$) is obtained for the pH differences in the nine preparations of buffer.

Stability

We have found that over two to three hours successive introductions of 6·835 buffer give readings which agree to within 0·3 mV (0·005 pH) without adjustment to the potentiometer. These measurements were obtained during pH estimations on numerous samples of blood (about 12 per hour). This shows that repeated standardisations with buffer are unnecessary, at least over this time interval.

Discussion

It has become clear in the past few years that the estimation of the pH of the blood may be of great value in the diagnosis and treatment of numerous clinical conditions, especially those associated with disordered respiration. Respiratory failure is an emergency in which the blood pH and PCO_2 may need to be estimated quickly if correct treatment is to be given. In our efforts to develop a method of measuring the blood pH which would include simplicity, speed, accuracy, and above all reliability we have met with several difficulties.

Accurate control of the temperature of the glass electrode and measurement at the temperature of the patient is essential for blood-pH work. Temperature corrections may apply to normal blood but are unsuitable for pathological blood in which hæmoglobin, serum-protein, and electrolytes may differ greatly from normal.

The most vulnerable part of any system for measuring blood pH is the glass electrode. Until the past year we have used a slightly different electrode and have had a great deal of trouble from sudden unpredictable failure. Various gums were used to seal the pH-sensitive bulb to the glass stem bearing the ground-glass cone. We believe that the deterioration of the seal led to breakdown of the insulation and to erratic results. We have had no trouble from this source with the present electrodes, which are entirely glass sealed. The electrodes require no special cleaning and are stored in distilled water before use.

The liquid junction between the fluid being measured and the KCl salt bridge poses several problems for which many solutions have been suggested. We have found that a capillary works very well in practice. It has an advantage over porous fibres, sintered glass, and ceramic plugs in that, since protein is not precipitated in it, there is no special problem of cleaning.

The two types of instrument used for measuring the E.M.F. of a pH cell are the potentiometric (null-point) and the direct reading. These both incorporate amplifiers for use with the high-impedance glass-electrode system, based either on electronic valves or dynamic capacitors. The pH cell described here works equally well with both types of instrument. The use of batteries or of accumulators as a source of power is a disadvantage in measuring blood pH, where it is often important to be able to take a reading at short notice. When the battery-operated instrument is first switched on, 20 minutes are needed for warming up. If the instrument is left on, the power supply is rapidly exhausted. A mains-operated instrument may be left running continuously and then needs no warming-up period.

Accuracy is of more importance here than in much pH work; so that the meter used must have a correspondingly better performance. For greatest accuracy a high zero stability is required if the zero setting is not to be checked constantly for drift. Here the dynamic capacitor has a considerable advantage over the valve-operated amplifier because its stability is greater by a factor of at least 10. At the same time, a direct reading meter is simpler and quicker to use than a null-point instrument. The chief requirements of a direct reading meter are linearity of response, meter accuracy, and stability of amplifier gain. These have been satisfactorily met in modern instruments.

The final problem to which we wish to draw attention concerns the standard buffer solutions used in blood-pH work. The buffers we have described and the pH values ascribed to them have probably the widest acceptance in Great Britain and in the U.S.A. For the results of pH measurements of the accuracy required in biological work to be comparable from laboratory to laboratory it is essential to adopt a common pH scale, such as the Hitchcock-Taylor scale described here. We have already mentioned that some intermediate buffers available commercially are far from their nominal value when tested. Others with whom we have discussed this point have had similar experience.

Summary

A method is described of measuring the pH of body-fluids anaerobically and at controlled temperature. It is designed for small samples (0·5 ml.) and is of suitable accuracy and reliability. The method incorporates a specially designed pH cell which is used with a commercially made direct-reading millivoltmeter modified by the incorporation of a simple potentiometer to be suitable for pH measurements.

Electronic Instruments Ltd., Richmond, Surrey, England, supplied the 'Vibron Electrometer model 33B,' the glass electrode 18395, and the calomel electrode 18357. A pH cell and perspex box based upon our design and a suitable potentiometer may also be obtained from them. Townson & Mercer Ltd., Croydon, England, supplied the thermostat bath and recirculating pump, model 'BX 148/U.' We wish to thank Dr. G. Mattock and Dr. J. Jackson for their helpful comments on the manuscript.

REFERENCES

Astrup, P. (1956) *Scand. J. clin. Lab. Invest.* **8**, 33.
Hitchcock, D. I., Taylor, A. C. (1938) *J. Amer. chem. Soc.* **60**, 2710.
Severinghaus, J. W., Stupfel, M., Bradley, A. F. (1956) *J. appl. Physiol.* **9**, 189.

Medical Societies

AMERICAN SURGICAL ASSOCIATION

THIS association's annual meeting was held in Chicago from May 8 to 10, under the chairmanship of Dr. LOYAL DAVIS (Chicago, Ill.).

Injury Due to Atomic Explosion

Dr. JOHN MORTON (Rochester, N.Y.) had seen Americans, Japanese, and Marshall Islanders burned by the fallout of radioactive dust following the explosion of the H bomb at Bikini. Injury was mainly due to β-irradiation causing epilation, vesication, and purpura superficially, with fever, vomiting, diarrhœa and failure of blood coagulation; mortality was approximately 50% in those exposed to 200r, 100% after 600r. Ulceration starting at a late stage had been seen in some who had recovered from the acute effects.

Dr. J. GARROTT ALLEN (Chicago, Ill.) had studied the effects of γ-irradiation on dogs. Though all had died after receiving 300r it was difficult to predict which would survive following lesser doses; 300–400r in a single exposure was fatal to man. In dogs surviving non-lethal doses the white blood-cells returned to normal only after 30 days, thrombocytes after 50 days, and red blood-cells after 75 days. Supportive treatment with blood and platelet infusions and antibiotics during this period had no effect on the eventual outcome. There was therefore no effective treatment, though shielding of the head at the time of exposure reduced mortality; additional shielding of the spleen and long bones improved the chances of survival. Surgery for debridement of wounds and the reduction of fractures must be undertaken during the first 48 hours or after the 30th day since operative interference within this period caused death, the real cause of which was not understood. In the event of atomic war the policy of delayed primary or secondary suture would therefore have to be revised.

Dr. J. BARRETT BROWN (St. Louis, Miss.) referred to the dangers of exposure to electron streams for those working with cathode-ray tubes. Accidents of this nature caused burns which became manifest 2–4 weeks later.

Wound Infection

Dr. CHESTER W. HOWE (Boston, Mass.) said that at the Massachusetts Memorial Hospitals the infection-rate after clean operations had been 1% in 1949 but had risen to 4% in 1953 and persisted at that rate till 1956; the investigation concerned approximately 1200 operations each year. Over the same period the incidence of infections with *Staphylococcus aureus* had increased from 57 to 80% and antibiotic-resistant strains had developed. There appeared to be no relation to the staphylococcal carrier-rate, which was 99% in 1953 but had fallen to 73% in 1956. The increased incidence of infection had occurred wholly in patients operated on by the junior staff, for in the private wards the incidence had remained at 1% throughout the period of study.

Dr. DERYL HART (Durham, N.C.) said that ultra-violet radiation had solved this problem, and that operating-theatres so equipped were quickly sterilised.

Dr. HENRY T. BAHNSON (Baltimore, Md) described 5 cases of staphylococcal bacteræmia and septicæmia following the use of silk sutures within the heart or great vessels; infection persisted until the sutures were removed and replaced by catgut or wire.

Dr. OSCAR CREECH, jun. (New Orleans, Louisiana), analysed 558 cases of tetanus seen between 1942 and 1956; the mortality-rate had fallen from 43% in 1943 to 33% in 1956, and antibiotic therapy appeared to have been relatively ineffective. Antitoxin was still the main line of defence; 75% of the deaths occurred during the first 4 days of the disease, and the outcome appeared to be related more to the amount of toxin produced than to the effects of treatment. Only 1 case had been seen in a patient previously receiving tetanus toxoid.

Complication of Œsophagogastric Resection

Benign gastric ulcer in 4 patients after œsophagogastric resection for carcinoma was discussed by Dr. CURTIS A. SMITH (Chicago, Ill.), who suggested that it might result from delay in gastric emptying due to the inevitable vagotomy, since experimentally increased secretion in Heidenhain pouches had been found under these circumstances. Gastro-enterostomy in 1 case had effected a cure for 6 years. He felt that œsophagogastric resection should always be accompanied by gastro-enterostomy.

Hypoparathyroidism

Peptic ulcer was one of the indications of hypoparathyroidism cited by Dr. LEON GOLDMAN (San Francisco, California), the others being nephrolithiasis, bone lesions, and acute hypercalcæmia, in that order of frequency, though there were sometimes no leading symptoms. The serum-calcium might not always be significantly elevated, and he described a further diagnostic test involving the assessment of renal tubular reabsorption of phosphorus, which was low in 20 of 21 cases in which there was no uræmia.

Calcium Metabolism

Dr. GEORGE H. CLOWES (Cleveland, Ohio) had seen hypotension unrelated to low blood-volume during and after prolonged operations, particularly intra-thoracic procedures incurring hyperkapnia and hypoxia causing respiratory and metabolic acidosis. He found that the blood-calcium fell before the end of the operation with an associated rise in circulating phosphate and lactate. The protein-bound fraction of calcium was not affected, and the hypocalcæmia was due to a fall in ionised calcium; incomplete oxygenation might be a cause, as might citrate in blood replacement.

Nitrogen Balance

Dr. WILLIAM D. HOLDEN (Cleveland, Ohio) presented metabolic studies demonstrating that nitrogen deficit after surgical operations was due to a failure of adequate nitrogen intake in the postoperative period. With appropriate intravenous nitrogenous intake using hydro-

lysates positive balance could be maintained; patients would not ingest sufficient nitrogen when left to eat what they wished, and the negative nitrogen balance under these circumstances exactly correlated with the degree of nitrogen starvation. But, owing to tissue breakdown, equilibrium could not be obtained in inflammatory states.

Cardiovascular Surgery

Dr. CONRAD R. LAM (Detroit, Michigan) showed the value of cardiac arrest induced by an intracardiac injection of acetylcholine while extracorporeal circulation was being maintained. Intraventricular septal defects could then be sutured in a quiet dry heart; this had been achieved in 35 out of 50 patients operated on thus, the others having other cardiac defects. There had been no increased incidence of atrioventricular block.

Extracorporeal circulation had enabled Dr. DENTON A. COOLEY (Houston, Texas) to excise aortic aneurysms, the circulation being maintained from the left atrium to the left femoral artery for thoracic aneurysms, and from the thoracic aorta to the left femoral artery for upper abdominal aneurysms even when impinging upon the thorax.

Dr. C. WALTON LILLEHEI (Minneapolis, Minnesota) had repaired a ruptured aneurysm of the sinus of Valsalva in 3 cases with the aid of extracorporeal circulation. The patients were aged 10, 19, and 37, and the clinical histories revealed that the aneurysms had ruptured suddenly causing a fistulæ with a shunt of blood-flow from left to right heart; operative cures were complete.

Dr. W. G. BIGELOW (Toronto, Ontario) reported 20 cases in which open heart surgery was undertaken with only 2 deaths, using an improved method of hypothermia designed to avoid rewarming shock due to metabolic acidosis by avoidance of shivering and peripheral vasoconstriction with the use of chlorpromazine, and by inducing respiratory alkalosis during cooling and operation. The use of heparinised rather than citrated blood had permitted ventricular fibrillation to be corrected when it developed.

Dr. CHAMP LYONS (Birmingham, Alabama) had used by-pass grafts to overcome the effects of thrombosis of the internal carotid artery. Dr. RICHARD WARREN (Boston, Mass.) advocated arteriography in all hemiplegics since some cases were due to carotid thrombosis and were therefore treatable.

Dr. HOWARD MAHORNER (New Orleans, Louisiana) suggested that in massive thrombosis of femoral or subclavian veins the clot should be sucked out and a course of heparin be given; he had done 16 such operations with good results in 12.

Dr. WILLIAM G. ANLYAN (Durham, N.C.) had studied 453 cases of venous thrombo-embolism and in 19 had seen severe arterial spasm which was relieved by heparin, perhaps because of its antagonism to 5-hydroxytryptamine. In half of 66 patients with pulmonary embolism there had been no clinical evidence of venous thrombosis elsewhere. He could find no evidence of association between venous thrombosis and occult cancer; 792 cases of bronchial, gastric, and pancreatic carcinoma had yielded only 5 cases of thrombosis; in none of 26 cases of "idiopathic" thrombosis had full investigation revealed cancer.

Cancer

Dr. GEORGE E. MOORE (Buffalo, N.Y.) had studied cancer cells circulating in the blood-stream; in 52% of 179 cases of carcinoma at different sites and in 75% of cases of carcinoma of the stomach, malignant cells were seen in smears prepared from the peripheral blood. Samples of blood were prepared by adding a fibrinogen-heparin mixture and permitting gentle erythrocyte sedimentation; smears were made from the buffy upper layer, which contained white cells and malignant cells. Scanning was tedious and required an average of 3 hours per case. It was emphasised in discussion that many circulating malignant cells must be destroyed since there was no definite correlation on follow-up between metastasisation and survival on the one hand and the earlier observation of circulating cells on the other. Nevertheless Dr. JULIAN JOHNSON (Philadelphia, Pa.), who had followed 218 patients to 5 years after resection of the lung, had found only 3% survivors among those with vascular invasion as opposed to 71% among others; 88% survived 5 years when neither vessels nor lymph-nodes were involved. Survival was related more to the absence of vascular than of lymphatic invasion.

Dr. MILLAR BELL (Chicago, Ill.) presented experimental work showing that nitrogen mustard had a retarding effect on malignant cells injected into the portal vein of rats and was most effective when administered within an hour of the malignant inoculation.

Dr. WARREN H. COLE (Chicago, Ill.) was treating patients on these lines with appropriate control series; 65 patients with abdominal malignancy had been given nitrogen mustard 0·1 mg. per kg. body-weight with a maximum total dose of 30 mg. in three administrations, the first intraperitoneal and the others intravenous. He said that this treatment should be avoided in patients over the age of 70; that leucopenia could be disregarded unless the white-cell count fell by more than 3000; and that blood-transfusions should be given from the 8th day to counter hæmopoietic depression.

Dr. R. K. GILCHRIST (Chicago, Ill.) had been exploring the possibility of destroying the lymph-gland field draining a malignant area by means of induced heat. Fine particles of Fe_2O_3, 0·02–0·1 μ in size, would after injection pass to lymph-glands but would not pass through them; high-frequency currents of 12,000 watts applied externally rapidly raised the temperature in glands in laboratory animals.

Dr. JONATHAN E. RHOADS (Philadelphia, Pa.) made a plea for Whipple's type of operation in cases of pancreatico-duodenal carcinoma; of 17 cases submitted to resection, there were 6 survivors for 5 years among those with growths of the ampulla of Vater, the common bile-duct, and the duodenum, but none among those with cancer of the head of the pancreas. Dr. JAMES T. PRIESTLEY (Rochester, Minn.), however, had had 15% 5-year survival following excision of lesions of the pancreatic head.

Choledocho-jejunostomy

Dr. ALFRED M. LARGE (Detroit, Michigan) had undertaken experimental work which indicated that biliary infection following choledocho-jejunostomy occurred because of reflux through the stoma into the gall-bladder; cholecystitis ensued with gall-stone formation. If the gall-bladder was removed at the time of the anastomosis, infection did not occur in the biliary tree. He presented clinical evidence to support his experimental findings and advocated cholecystectomy in association with biliary anastomosis to intestine. Dr. JOHN H. MULHOLLAND (New York), on the other hand, did not regard reflux as the cause.

Experimental Pancreatitis

Dr. DANIEL W. ELLIOTT (Columbus, Ohio) had shown experimentally that pancreatitis did not follow the reflux of bile into the pancreatic duct, but that pancreatic enzymes, which were secreted at a higher pressure than bile, passed into the biliary system where trypsinogen became activated on mixing with the bile, and the

mixture, if then passed into the pancreatic duct, caused hæmorrhagic pancreatitis.

Hepatic Cirrhosis

Dr. FREDERIC W. TAYLOR (Indianapolis, Indiana) had induced cirrhosis in animals by the repeated injection of silicon dioxide into the portal system over a period of 3 years; portal hypertension was not then associated with cirrhosis.

It was observed by Dr. NATHAN A. WOMACK (Chapel Hill, N.C.) that venous dilatation in patients with cirrhosis was not always accompanied by a rise of pressure in the portal systems; the vascular dilatation might be hormonal.

Dr. WILLIAM P. LONGMIRE (Los Angeles, California) had found that Evans-blue injected into the hepatic artery was immediately found in the portal system of cirrhotic patients, whereas in health there was a delay due to the usual circulation-time; this indicated an arterio-portal shunt. This view was supported by the work of Dr. RICHARD M. PETERS (Chapel Hill, N.C.) in determinations of oxygen saturation in portal venous blood under experimental conditions.

Dr. WOMACK thought that the shunt might be in the gastric mucosa as demonstrated by Bentley and his colleagues at Newcastle upon Tyne.

Treatment of Ascites

Dr. CHARLES G. NEUMANN (New York, N.Y.) presented the results of ileo-entectrophy in 4 survivors of 10 patients treated thus for ascites. A segment of ileum was resected, and with its mesentery intact its mucosal surface was exposed by opening the segment longitudinally close to the mesentery; cæcum and ascending colon were removed so that the ileal segment could be attached by its serosa to the right posterior abdominal wall; the omentum was removed; gastrostomy obviated postoperative intubation, which might have induced hæmorrhage from œsophageal varices. Ascitic fluid had been absorbed in all 4 survivors. The colon was not suitable for ascitic absorption, because of its greater tendency to secrete mucus.

Hirschsprung's Disease

Dr. OVAR SWENSON (Boston, Mass.) presented the results of resection of aganglionic segments in 200 patients with Hirschsprung's disease. There were 6 deaths and 5 lost to follow-up. 73 patients had been followed for 5–10 years; 72 were well, 1 had recurrent diarrhœa. To 5 years the figures were 64 followed, 63 well, 1 with chronic constipation; to 2 years 52 followed, 49 well, 3 with recurrent diarrhœa.

Reviews of Books

Functions of Autonomic Transmitters

The Abraham Flexner Lectures, series no. 13. J. HAROLD BURN, M.D., professor of pharmacology, Oxford University. London: Baillière, Tindall, & Cox. U.S.A.: Waverly Press Inc. 1956. Pp. 228. 40*s.*

Professor Burn delivered the thirteenth series of Abraham Flexner lectures at Vanderbilt University last year. They are now reproduced in this book.

Two chapters are devoted to the actions of acetylcholine with special reference to its function in controlling contraction of heart-muscle and ciliary movement. A further chapter describes the actions of noradrenaline, and the problems associated with change in the sensitivity of denervated structures are fully discussed. The common properties of local anæsthetics, drugs with a quinidine-like action, spasmolytics, and antihistaminics are related to their ability to depress the action of acetylcholine in the tissues concerned. Much of this fundamental research has been carried out in Professor Burn's laboratory, and he writes with the authority of many years spent in the study of the problems of autonomic transmission.

The first and last chapters are of more general interest, dealing with some aspects of medical education and research, the antidiuretic effects of smoking, and the influence of alcohol on motor-car driving.

Physiologists and pharmacologists working in this special field will wish to have Dr. Burn's book at hand. In most of the chapters they will find interesting suggestions for further research.

1957 Supplement to the British Pharmaceutical Codex 1954

London: Pharmaceutical Press. £1 7*s.* 6*d.*

THIS supplement contains 44 new monographs, including 10 which relate to drugs added to the *British Pharmacopœia* by the Addendum of 1955. The changing face of therapeutics is reflected in the inclusion of a substantial number of potent drugs such as acetazolamide, meclozine hydrochloride, pentolinium tartrate, phenoxymethylpenicillin, and tetracycline hydrochloride. There is a long list of older preparations which have been modified, and the corresponding monographs have been appropriately amended.

The importance of the *B.P.C.* has been greatly increased in recent years by the inclusion of well-written sections on the actions and uses of the drugs listed. Hence this publication is not only invaluable for pharmacists who need a book of reference which has a wider scope than the *B.P.*, but is a first-class investment for the medical practitioner and specialist.

Progress in Nuclear Energy Medical Sciences

Series VII, vol. I. Edited by J. C. BUGHER, The Rockefeller Foundation, New York; J. COURSAGET, C.E.A. Society; J. F. LOUTIT, Medical Research Council, A.E.R.E., Harwell. London and New York: Pergamon Press. 1956. Pp. 165. 42*s.*

THE first volume of a series, this book is based on papers presented at the Geneva conference on the peaceful uses of atomic energy.

Each of the seven chapters summarises in a slightly different way the work and papers of many authors, yet each remains a coherent account and not simply a list of statements and references. The first four chapters deal with the main clinical medical uses of radioactive isotopes and the last three with radiation protection and legislation, and radiation dosimetry. Industrial and general public-health aspects of radiation exposure and protection might perhaps have received fuller treatment. Nevertheless, this is a good book and a useful work of reference.

The Head and Neck in Roentgen Diagnosis

2nd ed. Vols. I and II. EUGENE P. PENDERGRASS, M.D., professor of radiology and chairman of the department of radiology, University of Pennsylvania; J. PARSONS SCHAEFFER, M.D., PH.D., emeritus professor of anatomy and director of the Daniel Baugh Institute of Anatomy, Jefferson Medical College; PHILIP J. HODES, M.D., professor of radiology, University of Pennsylvania. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956. Pp. 1759. £14.

AFTER a lapse of fifteen years, another edition of this book has been produced, dedicated to the memory of Prof. H. K. Pancoast, the original author. The text has been completely rewritten and now covers every aspect of the radiology of the head and neck. There are excellent chapters on the examination of the brain by angiography and ventriculography. Throughout the book, the common and often misleading variations of normal are distinguished from the frankly pathological. Diseases which may affect the head and neck, though they originate in other parts of the body, have been included. The clinical and pathological, as well as the radiological, findings are incorporated in a straightforward narrative, backed up with enough detail of anatomy, differential diagnosis, and radiographic technique to make it one of the better textbooks available in the English language.

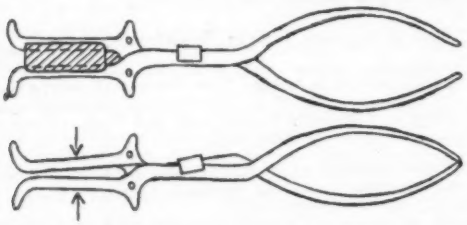
Lumbar Puncture and Spinal Analgesia (2nd ed. Edinburgh and London: E. & S. Livingstone. 1957. Pp. 142. 25*s*.).—The second edition of this very helpful little monograph by Sir Robert Macintosh will be as acceptable as the first in providing a refreshing approach to an old subject, by one who speaks from long experience and with mature opinion. In the interval between the two editions the courts have decided some important cases in which neurological complications of spinal analgesia figured conspicuously. This book emphasises clearly the importance of proper sterilisation in avoiding these complications.

Regulation and Mode of Action of Thyroid Hormones (*Ciba Foundation Colloquia on Endocrinology*. Vol. 10. London: J. & A. Churchill. 1957. Pp. 304. 48*s*.).—This is the report of a conference held last June under the chairmanship of Dr. Rosalind Pitt-Rivers and attended by speakers from Europe and North and South America. The papers are edited by Dr. G. E. W. Wolstenholme and Miss Elaine C. P. Millar, A.R.I.C.

New Inventions

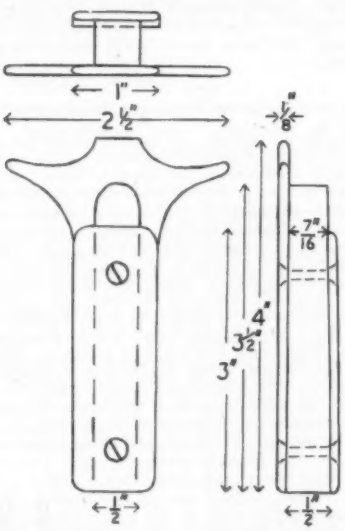
KIELLAND'S FORCEPS HANDLE-LOCK

THE sliding-lock mechanism of Kielland's obstetric forceps, which is necessary for the easy articulation of the blades and for the correction of asynclitism, results in a gap between the handles and a lack of stability. Any



grip applied to the handles with the forceps correctly applied will cause a crushing force to the fœtal head.

The handle-lock illustrated is made of stainless steel and is applied after asynclitism has been corrected. It ensures a firm grip of the handle without any tendency



to crush the head. It produces perfect alignment of the blades, and, because the Kielland's handles are wedge-shaped it will not slip off.

Holborn Surgical and Veterinary Instruments Ltd., Margate Road, Broadstairs, are proposing to make the handle-lock in solid stainless steel.

J. M. HOLMES
Guy's Hospital, London M.D. Lond., M.R.C.O.G.

A MODIFICATION OF THE TONGUE-PLATE OF THE BOYLE-DAVIS GAG

IN oropharyngeal surgery, tracheal intubation is well recognised as a valuable means of maintaining control of the airway at a light level of anæsthesia. The disadvantages of intubation by the nasal route are such that there may be a place for a means whereby it can be avoided in the commonest of all oropharyngeal operations—namely, tonsillectomy.

Fig. 1.

A simple modification of the tongue-plate of the Boyle-Davis gag allows tonsillectomy in children and adults to be performed after orotracheal intubation without the tube encroaching on the field of operation (fig. 1).

A slot is cut in three-quarters of the length of the tongue-plate and the lingual aspect of the slot bevelled to accommodate the tube. A metal bridge is fitted at the distal end of the slot to prevent the tube wedging in it. The lingual surface of the tongue-plate proximal to the slot is grooved slightly to hold the tube centrally.

Anæsthesia is induced and an endotracheal tube is passed through the mouth. This is fixed so that it lies centrally over the tongue, lips, and incisor teeth. The surgeon then inserts the gag by sliding the bridge at the distal end of the tongue-plate over the tube within the mouth. Care must be taken at this stage to ensure that the central fixation of the tube is not disturbed.

The tongue-plates are made in three sizes, the largest being suitable for adults (fig. 2). It is recommended that Magill's tubes sizes 1–3 be used with the 3 in. tongue-plate, sizes 3–6 with the $3^1/_2$ in. tongue-plate, and sizes 7–10 with the 4 in. tongue-plate.

Tongue-plates incorporating a similar idea have been described previously.[1,2] This modification, which was introduced at the section of anæsthetics of the Royal Society of Medicine on March 1, is recommended on the grounds of simplicity and the fact that standard tongue-plates may, if desired, be modified by the manufacturers.

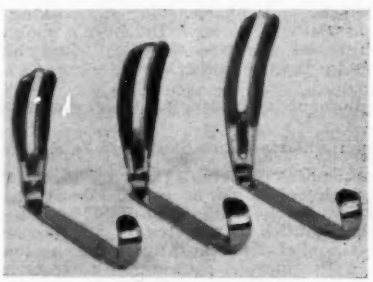


Fig. 2.

The modified tongue-plates may be obtained from Messrs. Down Bros. and Mayer & Phelps Ltd., 32, New Cavendish Street, London, W.1.

ANDREW DOUGHTY
Kingston Hospital Group M.B. Lond., F.F.A.R.C.S., D.A.

1. Humby, G., Hawksley, M. *Brit. med. J.* 1943, i, 317.
2. Monro, J. S. C. *Ibid*, 1948, i, 267.

The role of **cellular metabolic stimulus** in medical practice

L-Triiodothyronine (issued by Glaxo as 'Tertroxin') is recognised as probably the ultimately effective hormone of the thyroid acting directly on the metabolic cell processes.

OBESITY In the treatment of obesity, the stimulus to the cellular metabolism from Tertroxin is of great value, along with dietary measures.

DYSMENORRHOEA Tertroxin is helpful in the treatment of dysmenorrhoea. It may be given for three or four days before menstruation begins and continued for two days afterwards.

GERIATRICS Many elderly patients manifest waning metabolism by a variety of symptoms. The functional improvement and increase in mental and physical vigour after giving Tertroxin in selected cases make it useful in the treatment of geriatric disorders.

TERTROXIN

(L-Triiodothyronine Sodium Glaxo)

Tertroxin acts swiftly, is non-cumulative and can be adjusted to suit the patient's response.

Tablets. 20 micrograms (scored): Bottles of 50 and 500. 5 micrograms: Bottles of 50

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRON 3434

'Eminently suitable for medicinal purposes'

'In view of these analytical and general evidences, this brandy may be described as particularly suitable for medicinal purposes'

See Lancet, July 22, 1899, p. 219

'The evidence both of analysis and taste indicates that the high standard of purity and quality has been maintained and that the brandy is eminently suitable for medicinal purposes'

See Lancet, May 7, 1932, p. 992

make friends with MARTELL

BAYER

When spring means Hay Fever

NEOPHRYN with Antihistamine nasal spray safely relieves the symptoms of allergic rhinitis. Nasal congestion is relieved and local irritation reduced, without rebound congestion or other troublesome side-effects.

NEOPHRYN

Trade Mark

with Antihistamine

1-m-hydroxy-α-methylaminomethyl benzyl alcohol HCl 0.5%, with thenyldiamine HCl 0.1%, supplied in a yellow plastic atomiser. Basic N.H.S. cost: 2s. 8d.

BAYER PRODUCTS LIMITED

Neville House, Kingston-on-Thames, Surrey

Associated exporting company: WINTHROP PRODUCTS LTD.

THE LANCET

LONDON: SATURDAY, MAY 25, 1957

The Immunology of Thyroid Disease

A YEAR ago it might have seemed preposterous to suggest that immunology had anything important to contribute to the study of diseases of the thyroid gland. Yet on May 8 the section of experimental medicine of the Royal Society of Medicine was able to hold on this topic a full-length discussion whose liveliness showed clearly that a new and stimulating idea has been injected into medical thought.

The guest of honour was Prof. E. WITEBSKY, whose main interest for the past twenty-eight years has been organ-specificity as demonstrated by immunological reactions, particularly in relation to the thyroid gland. In the past few years he and his colleagues at Buffalo have been observing the response of animals to the injection of extracts of thyroid glands derived from the same species. These observations have driven Professor WITEBSKY, with considerable reluctance, to admit that true auto-antibodies can be formed—a conclusion which appears to defy the principle of *horror autotoxicus*, enunciated many years ago by his old master EHRLICH. WITEBSKY and his colleagues have actually demonstrated that a rabbit can make antibodies against an extract of its own excised thyroid. These antibodies are by no means merely an academic curiosity, for they have been shown to be associated with constant and often severe damage to the animal's thyroid when this has been left in situ.[1]

Professor WITEBSKY relates that it was his colleague at Buffalo, Dr. DOUGLAS RIGGS, who first looked down the microscope at sections of the damaged thyroids of his rabbits and made the significant remark: "That looks like Hashimoto's thyroiditis." WITEBSKY was quick to follow up the implications of this comment, and soon showed that in clinical cases of Hashimoto's thyroiditis (lymphadenoid goitre) there were circulating antibodies against extracts of human thyroid gland. He was slow to publish his results; and he has been anticipated by the entirely independent observations made at the Middlesex Hospital by Dr. ROITT, Dr. DONIACH, and their colleagues.[2] These workers started from the observation (already recorded by FROMM et al.[3] and by LUXTON and COOKE [4]) that patients with Hashimoto's thyroiditis tend to have an unusually large amount of circulating γ-globulin, commonly associated with abnormal flocculation tests. DONIACH and ROITT had the happy thought that the excess γ-globulin might actually represent circulating antibody. They made an extract of normal thyroid gland, added it to serum from patients with Hashimoto's thyroiditis, and obtained easily demonstrable precipitates. The amount of these precipitates is quite startling to immunologists, who normally regard the human animal as a poor producer of precipitating antibodies.

1. Rose, N. R., Witebsky, E. *J. Immunol.* 1956, **76**, 417.
2. Roitt, I. M., Doniach, D., Campbell, P. N., Hudson, R. V. *Lancet*, 1956, ii, 820.
3. Fromm, G. A., Lascano, E. F., Bur, G. E., Escalente, D. *Rev. Asoc. méd. argent.* 1953, **67**, 162.
4. Luxton, R. W., Cooke, R. T. *Lancet*, 1956, ii, 105.

The next development was that both WITEBSKY, and ROITT and DONIACH, showed quite clearly that purified human thyroglobulin could replace thyroid extract for the demonstration of these reactions. Similarly the rabbit antibodies and thyroid reactions can be evoked equally well by the use of rabbit thyroglobulin. Professor WITEBSKY added the warning that no-one so far has obtained a thyroglobulin which can be regarded as pure; the preparation made in his own laboratory, which he thinks is probably the best yet made, still contains 5% or more of impurities. Provisionally, however, it seems to be agreed that thyroglobulin itself is probably the antigen which provokes the auto-immune response; and this idea is supported by studies with fluorescent antibodies. By this technique Professor WITEBSKY found that when labelled antibody is brought into contact with sections of rabbit thyroid it becomes concentrated mainly in the region of the colloid within the acini. Dr. R. G. WHITE, of the London Hospital, has done the same thing with human thyroids, using serum from cases of Hashimoto's thyroiditis; and here too the antibody was concentrated in the colloid. To remove any doubts about the possibility of irrelevant iso-antibodies he has demonstrated the same phenomenon in the thyroid of a patient with Hashimoto's thyroiditis, applying the patient's own serum. Again the antibodies collected in the colloid of the few remaining active acini, providing convincing evidence of auto-immunity caught in the act. Small amounts of antigen (detected by the labelled antibody) also appeared to be present in some of the cells which invade the thyroid in large numbers in this disease.

Dr. WHITE had also made use of the fluorescing technique to detect the corresponding antibody. The adjacent lymph-nodes are often enlarged in Hashimoto's thyroiditis, and WHITE very reasonably argued that this might be because they were called on to produce at least a large part of the antibody to thyroglobulin. He took one of these lymph-nodes and applied to it first thyroglobulin, and then labelled antibody to detect the thyroglobulin. The marker collected in discrete spots which could be interpreted as the sites of antibody formation. On the basis of these results he put forward the suggestion that antibody is formed in three stages. An initial leak of thyroglobulin attracts a collection of lymphocytes and plasma cells within the thyroid, which themselves make antibody locally. Cellular destruction resulting from the antigen-antibody reaction may cause the release of more thyroglobulin, thus initiating a sort of chain-reaction. Some of this thyroglobulin escapes into the surrounding lymph-nodes, where the second stage of antibody formation is stimulated. Finally some thyroglobulin gets into the general circulation, so that antibodies are produced by other tissues and become demonstrable in the serum.

There is still some uncertainty as to the best way of demonstrating the circulating antibodies. The first method to be employed was that of simple precipitation. In suitable cases this method can be most spectacular; but it is not very sensitive. By this method in Britain precipitating antibodies have been found in only about half the cases of Hashimoto's thyroiditis; and Professor WITEBSKY's experience in Buffalo has been even more disappointing. He prefers a method in which tanned red cells are coated with antigen and then agglutinated by the antibody. In his hands this technique has been specific and astonishingly sensitive, both in rabbits and man, with serum titres up to the fantastic figure of 1 : 2,000,000. Yet even with this sensitive instrument he could still detect antibodies in only a minority of cases of Hashimoto's thyroiditis. The discrepancy between his results and those of the British workers may lie in the realm of diagnosis; at least this seems a more likely

explanation than that some radical difference exists between Hashimoto's thyroiditis in Buffalo and in London. Pathologists are by no means agreed as to which cases should be called Hashimoto's thyroiditis, and which are better described as chronic non-specific thyroiditis. Possibly before long the responsibility for diagnosis will be taken over from them by the immunologists. The third—and most controversial—method of detecting antibodies is by complement-fixation. Professor WITEBSKY has had no success with this method in man, though it is sensitive and reliable in detecting antibodies in immunised rabbits. Dr. ROITT likewise has had little success in detecting antibodies in this way. Dr. WHITE, on the other hand, using thyroglobulin prepared from thyrotoxic thyroids as his antigen, has been able to detect complement-fixing antibodies in nearly all cases of Hashimoto's thyroiditis which he has examined. So, too, has Dr. J. R. ANDERSON, of Glasgow; his antigen is an extract of thyrotoxic thyroid. Dr. W. R. TROTTER, Dr. G. BELYAVIN, and Miss A. WADDAMS, of University College Hospital, have had a mixed experience. At first, using an extract of normal thyroid as their antigen, they were quite unable to detect complement-fixing antibody; but later, using an extract of thyrotoxic thyroid, they found antibodies in almost all their cases of Hashimoto's thyroiditis. Their preliminary separation experiments with an extract of a thyrotoxic gland indeed suggest that the precipitating and complement-fixing antigens may be distinct substances. This suggestion is interesting in that it implies that the complement-fixing antigen may be specific to thyrotoxicosis, which would at once broaden the scope of the investigation to include this mysterious disease. But both Dr. WHITE and Dr. ANDERSON have obtained complement-fixation with extracts of normal thyroid, though the titres were much lower than with thyrotoxic thyroids. At least all workers seem to agree that for complement-fixing tests thyroid extracts from patients with thyrotoxicosis provide the best antigen. Complement-fixing antibodies have been found in nearly all cases of Hashimoto's thyroiditis, in at least half of all cases of spontaneous myxœdema, in a substantial proportion of cases of thyrotoxicosis, and occasionally in normal subjects. This distribution is reminiscent of the distribution of what is often termed lymphadenoid change—that is, destruction of thyroid tissue and its replacement by an infiltration of lymphocytic cells. There may well be a correlation here; but it has not yet been proved.

It now seems that the initial event in Hashimoto's thyroiditis is the leakage of thyroglobulin out of the thyroid acini. Within the acinus thyroglobulin may be supposed to lead a secluded life, cut off from all contact with antibody-forming cells. Hence it dodges the principle of immunological tolerance so ably expounded by Prof. P. B. MEDAWAR, F.R.S., and his colleagues. The body's antibody-forming cells are not introduced to thyroglobulin in fœtal life, so it remains a stranger to them for ever after. To these cells a stranger is a foe. A small leakage of thyroglobulin therefore immediately attracts the attention of wandering antibody-producers; they collect in the thyroid; cellular destruction follows and more thyroglobulin is liberated, whereupon more antibody is produced. It is easy to see that such a process, once set going, may be self-perpetuating. This picture is an attractive one, and remarkably complete. In fact it leaves only one thing unexplained: what sets the process going? No-one so far seems able to provide a satisfying answer to this question. We should, however, be well content with the progress made in a very short time. The invasion of the thyroid field by the immunologists has begun well. The troops have been got ashore, and have secured a beachhead. The subsequent development of the operation should be well worth watching.

Towards Safer Clothing

THE past hundred years have seen great changes in the clothing materials used by women and children. Woollen garments, including flannel, and natural silk have been largely replaced by cotton fabrics and artificial silks (rayons); and, in general, these newer fabrics have been of lighter weight—in other words, less closely woven. These changes have considerably increased the risk of serious burning accidents. The woollens and natural silks did not ignite easily, and, if they did catch fire, the flame did not spread rapidly: so much is known to every man who has scorched his trousers standing by a fire. But with the cottons and rayons—especially those of light weight—the sequence of events is very different. Momentary contact (2–4 seconds) with a flame or the element of an electric fire is enough to ignite the material, and within half a minute most of a child's nightdress may be burning fiercely—especially if, as often happens, she runs about in terror and so fans the flames. By the early days of this century it was apparent that the increasingly popular flannelette—i.e., cotton material with a slightly fluffed-up surface—was associated with many fatal accidents to children. In 1905 *The Lancet* declared: "The days of flannelette should be speedily numbered." In 1908 the Home Office appointed a committee to consider the matter, but before any effective action could be taken the 1914–18 war diverted attention. In the past fifty years there have been something like 25,000 deaths from clothing burns in England and Wales, and about four times that number of people have received very serious injuries. After the 1939–45 war COLEBROOK and his colleagues[1–5] repeatedly called attention to the matter, stressing the danger of unguarded heating appliances and also of highly flammable clothing materials. In 1952 Parliament passed the Heating Appliances (Fireguards) Act, and in 1956 specifications for a standard guard for coal-fires were issued by the British Standards Institution.[6] These measures will certainly help to reduce the risk of clothing accidents in homes. But the menace of highly flammable clothing remains.

To deal with this a committee was set up in 1956 by the British Standards Institution, and its report has now been published.[7] The committee was fortunate in that a preliminary investigation had just been made by D. L. LAWSON and his colleagues

1. Colebrook L. *Mon. Bull. Minist. Hlth Lab. Serv.* 1946, **5**, 214.
2. Colebrook L., Colebrook, V. *Lancet*, 1949, ii, 181.
3. Colebrook, L., Colebrook, V. *Ibid*, 1951, ii, 579.
4. Colebrook, L. *Text. Merc. Argus*, 1953, **77**, 335.
5. Colebrook L., Colebrook, V., Bull, J. P., Jackson, D. M. *Brit. med. J.* 1956, i, 1379.
6. Fireguards for Solid Fuel Fires. B.S. 1956, no. 2788.
7. The Flammability of Apparel Fabrics in Relation to Domestic Burning Accidents. B.S.I., 1957, PD 2777.

in the laboratories of the Fire Research Organisation and the Department of Scientific and Industrial Research into the different methods of assessing the flammability risks associated with various clothing fabrics.[8] By an ingenious device which measures accurately the time taken for flame to travel vertically upwards over 100 inches of the material under test, LAWSON et al. had established the "flame-resistance rating" for a large number of fabrics. Broadly speaking there were three categories: the very lightweight materials, such as organdie, over which flame travelled 100 in. in 8–25 seconds (that is, their ratings were expressed as 8–25); the medium-weight cottons and viscose rayons, including flannelette and winceyette and mixtures of these with wool, which had a rating of 25–70; and the medium and heavy weight woollens, natural silks, nylons, and 'Terylene' (if untreated with flammable "finishes"), and some flame-proofed fabrics, all of which had a rating of 100–300. A subsequent study of 82 garments which had been involved in clothing burns showed that the great majority were of materials in the middle group, rated at 25–70, the most common having a rating of 40–50. Few burns had been caused by the most highly flammable materials (rated at 8–35), not because these are not dangerous, but because they are seldom worn by comparison with the materials rated at 25–70, many of which are in daily use—for instance, for children's nightdresses and women's dresses. None of the 82 burns had been caused by materials rated above 140.

In the light of these findings the committee considered whether all clothing fabrics offered for sale should in future be graded according to their flammability rating, but it finally decided that this would not at present be in the public interest. Instead it concluded that a "level of safety" should be designated, and that fabrics rated at or above that level "should be warranted as such and identified accordingly"—presumably by the familiar B.S.I. kite mark. Fabrics so marked will not, of course, be guaranteed as completely non-combustible (all fabrics will burn if exposed long enough to sufficient heat), but garments made from them will burn so slowly, if they should catch fire, that the wearer will have a good chance of putting out the flame before it has spread enough to cause a serious burn. This designation of a level of safety should prove a notable advance. But there is one difficulty. Under the Fabrics (Misdescription) Act, passed in 1952 and now largely forgotten, it became an offence to describe a material as possessing "in any degree" the quality of "non-inflammability" unless it passes a very stringent test (failure to ignite on exposure to flame for 12 seconds). A few fabrics which reach the level of safety now proposed by the committee might just fail to pass the severe test of the 1952 Act, and so could not legally carry the B.S.I. safety mark. To get over this difficulty the Act may have to be repealed.

The committee also stresses the importance of pressing on with the development of "flame-proofing" processes, which would bring many cottons and rayons within the safety zone. It calls attention once again to the importance of avoiding loose-flowing garments—e.g., nightdresses for children—and to the overriding need for guarding all heating appliances. Finally it emphasises that more effective propaganda is required to make the public aware of the risks of clothing burns, and more eager to demand safe materials. Doctors can help to eliminate clothing burns by advocating safer clothing materials, and passing on the committee's other recommendations—especially with regard to the guarding of electric and gas fires bought before the Fireguards Act came into force.

8. Lawson, D. L., Webster, C. T., Gregsten, M. J. *J. Text. Inst.* 1955, **46**, T 453.

Cutaneous Pain

APPARENTLY various cutaneous sensations can be painful; but it is not now believed that intense stimulation of nerve-endings of any type can cause pain. On the contrary, it is thought that the specialised nerve-ends can respond only to appropriate stimuli and that all forms of pain arise from the unencapsulated free nerve-ends which lie among the epidermal cells. The nerve-fibrils from these run into a nerve-net, or delta, which in turn unifies, through branches, to become a pain-carrying nerve-fibre. There is overlapping, but not continuity, of peripheral-nerve nets. Anatomically somatic sensory-nerve fibres are divided into C fibres, which are small in diameter and along which impulses travel more slowly than in the other, or A, fibres. Thus the shape and timing of the electrical potential changes during the passage of an impulse are typical and recognisable. It is possible, then, to apply to skin various stimuli known to be painful and at the same time record the potential changes in the sensory nerve, the pattern of these being a clear pointer to the type of nerve-fibre carrying the impulse. From evidence such as this it has been shown that the thinnest and most slowly conducting fibres of the A group are responsible for carrying the sensation of immediate or first pain, and that C fibres, conducting even more slowly, give rise to delayed or second pain. With this limited number of fibre-types, how is it that pain can vary not only in degree but in quality, and can be elicited by a wide variety of stimuli—all of which, incidentally, are calculated to damage tissues? That the nerve-ends are undifferentiated probably accounts for the range of physical and mechanical stimuli to which they respond. Many of the apparent differences in sensation depend on the duration as well as the intensity of the painful stimulus, for pain differs from most other types of sensation in that it does not adapt, or decline with time. Some of the differences depend on central ramifications. The pain nerve-ends also react to chemical stimuli, and some workers find it difficult to account for all the features of pain, especially abnormal types, without postulating the release of a chemical from damaged tissues. This substance might act by sensitising the nerves—i.e., reducing their threshold—or by causing them to discharge even after the painful stimulus has long ceased. In this connection LEWIS [1] tested skin extracts and found that they had pain-producing properties, and he went far towards defining the conditions in which they were most effective. He did not identify the substance responsible, but believed that it was not histamine.

One of the difficuties of this subject is to develop a means of measuring and recording the intensity and

1. Lewis, T. The Blood Vessels of the Human Skin and their Responses. London, 1927.

duration of pain. One method is that used by KEELE and his co-workers,[2] which depends on the subject's estimate of pain but gives reproducible results. According to the intensity of pain the subject gives more or less of a turn to a handle which raises or lowers a pointer writing on smoked paper. In this way a permanent record is obtained of the intensity, duration, and fluctuations in the pain felt. KEELE et al.[3] placed solutions of substances to be tested on the exposed base of a blister made by a standard method—usually by application of a small cantharides plaster. The subject was, of course, unaware of the nature of the solutions applied. It was found that high dilutions of acetylcholine (ACh) were immediately painful; 5-hydroxytryptamine (5-H.T.) gave rise to delayed pain; and histamine diluted 10^{-3} or 10^{-4} times was painful, but when diluted 10^{-5} or 10^{-6} times caused only itching. The action of these three compounds, which are widely distributed in body tissues and fluids, was compared with that of some of the body-fluids themselves. Blister fluid, for instance, immediately after collection had no pain-producing substance (P.P.S.); if the fluid was kept in a silicone-lined container P.P.S. developed only slowly, but if the fluid was in contact with glass P.P.S. appeared in a few minutes. The same behaviour was seen in other exudates, such as that from the knee-joint of patients with rheumatoid arthritis, from pleural effusions, and from protein-rich ascitic and hydrocele fluid. Human whole blood also reacted similarly. Pain-producing activity was greatest after five to eight minutes and then began to decline until after about an hour 90% of activity had gone. Were these fluids pain-producing because of their content of the fairly simple substances previously tested? With the help of another test the answer was found to be No. Originally the search was for a method more convenient than the frequent blistering of friends and other volunteers, as well as for some means of accurately comparing known chemicals with the unknown P.P.S. in mixed fluids. The isolated rat uterus suspended in a bath of saline solution proved useful. First, it was found that P.P.S. caused the uterine muscle to contract, and that, whereas the action of ACh was antagonised by atropine, that of P.P.S. was not. Histamine though causing pain had not caused the uterus to contract, and diluted P.P.S. did not cause itching. H.T. was at first the most probable candidate for the position of P.P.S.; but, again, substances which blocked the action of H.T. on the uterus did not block that of P.P.S.

The activation of body-fluids by contact with glass suggested some similarity to blood-clotting, and it was further found that protein-poor fluids did not produce P.P.S.; but there were dissimilarities that ruled out any direct relationship. Possibly P.P.S. is linked with some early stage of thromboplastin formation; but the evidence suggested that it might be a breakdown product of protein, possibly a polypeptide. By comparative tests the chemical and physiological behaviour of P.P.S. and bradykinin were found to be closely alike. Now, proteolytic enzymes abound in tissues, and it is known that in normal conditions stimulation of the chorda tympani nerve releases from the submandibular gland an enzyme which acts on plasma to form a bradykinin-like substance.[4] Also, tissue damage releases an active proteolytic enzyme from skin.[5] There is, then, nothing unreasonable in the idea that injured tissue may release an enzyme which acts on some component of plasma-proteins to form bradykinin, or something very like it, and that this substance causes pain, as it can be shown to do. During the time it is present in the tissues it may well affect the nerve threshold to other forms of stimulus. The decline in P.P.S. activity of body-fluids is probably due to the presence of other enzymes which hydrolyse it to an inactive state. If indeed bradykinin and P.P.S. prove to be identical, or even if bradykinin is only one of a group of similar substances, that is an important and useful step towards further understanding of the great problem of pain.

2. Armstrong, D., Dry, R. M. L., Keele, C. A., Markham, J. W. *J. Physiol.* 1953, **120**, 326.
3. Armstrong, D., Jepson, J. B., Keele, C. A., Stewart, J. W. *Ibid*, 1957, **135**, 350.
4. Hilton, S. M., Lewis, G. P. *Ibid*, 1955, **129**, 253.
5. Beloff, A., Peters, R. A. *Ibid*, 1945, **103**, 461.
6. Warren, F. TV in Medical Education. Chicago, 1955.

Annotations

TELEVISION AND MEDICINE

TELEVISION was first publicly demonstrated in Great Britain in 1928, and in the same year John Baird demonstrated colour television. A surgical operation was first televised in black and white (at the Johns Hopkins University) in 1947, and in colour (at the American Medical Association's convention in Atlantic City) two years later. Since then television for medical meetings and teaching has been developed extensively in the United States, and closed-circuit units have been installed in hospitals in London, Paris, and elsewhere. The first colour-television demonstrations of surgery in Great Britain will take place this summer.

Television is particularly suitable for demonstrating new or modified operative techniques to surgical colleagues. Because of its immediacy it is valuable for illustrating a talk, and the surgeon can discuss with his audience the rationale of each stage as he performs it. But there is a risk that the selected patient may prove unsuitable for the intended operation or that routine steps, such as procuring hæmostasis, may take unduly long. Both of these disadvantages may be avoided by using film; and rare or unique operations, such as the separation of conjoined twins, demand a permanent record, so here film has an undisputed advantage.

In medical schools television has little to commend it. A reel of film is shown much more easily—and cheaply—than a television demonstration requiring on each occasion, in addition to the clinical material, cameras, lighting equipment, crew, production staff, and lecturer. But conceivably a programme originating in one school might be broadcast to several others so that students might benefit from teaching sessions at several centres in addition to their own. Such a scheme has been attempted in the United States, where a handbook has been prepared for producers of medical television programmes.[6] It is becoming increasingly recognised that a medical student gains little from watching operations on a screen; in the short time he spends in the operating-theatre as an undergraduate he should learn primarily the conventions of sterile techniques and how to assist a surgeon usefully. This is now appreciated by most British film-makers, and only some 6% of the 1700 medical films available here show surgical procedures. Television might be applied more usefully to demonstrating cytological and bacteriological slides; and it may also prove useful as an image-intensifier in conjunction with radiographic screening.

For the non-specialist, television has an important future in public-health education and programmes of general medical interest. In America medical cases are presented in at least one regular weekly programme, and in France endoscopies have been demonstrated on the national television service.

WHEEZING

WHEEZING is the most obvious sign of an acute asthmatic attack. Like many other familiar phenomena, it has had comparatively little serious thought, and until quite recently hardly anyone has suggested that it may not arise (as generally supposed) from the passage of air through constricted bronchioles. The paper we publish this week by Dr. Dekker and Dr. Groen should serve at least as a basis for a review of the prevalent ideas. Briefly, they maintain that the wheezing sound is generated in the larger bronchi and trachea by the rapid and turbulent flow of respiratory gases through them when they are constricted by pressure from without: the pressure is applied within the thorax by the force of expiratory muscular contraction against the high resistance to gas flow offered by the constricted bronchioles. In their scheme of events bronchiolar constriction does not itself cause wheezing at all.

This explanation is not so unlikely as it may seem at first. One point in its favour is that the actual volume of gas flowing through a bronchiole during expiration must be very small indeed, and probably flow is streamline in character: these are not the conditions in which one would expect audible sounds, which require that flow should be turbulent and be of enough volume to generate sound waves of suitable power and frequency. A clinical observation which adds support is the well-known "pursed lip" breathing often seen in emphysematous patients. By adopting this mode of expiration, pressure is built up within the bronchial tree which helps to prevent collapse of the larger branches.

The investigations on normal people are of interest in relation to so-called psychogenic asthma. It is easy to see how patients with anxiety states might acquire the same trick of wheezing expiration—and also why their asthma might be completely cured by psychotherapy.

VITAMIN D AND THE PARATHYROIDS

WHEN Albright and Reifenstein [1] drew attention to the similarities between the metabolic effects of vitamin D and of parathyroid hormone, they were not convinced that either exerted a direct "calcæmic" action on bone; but since then both substances have been found to possess this property. Thus experimentally it has been shown beyond doubt that parathyroid extract raises the serum-calcium even after nephrectomy [2] and that vitamin D raises the serum-calcium of rachitic rats in conditions which make it impossible to ascribe this effect to increased absorption of calcium from the intestine.[3] The close similarity between the effects of vitamin D and of parathyroid hormone on bone is underlined by Barnicot's observation [4 5] that local implants of calciferol and parathyroid-gland tissue evoke the same osteoclastic reaction.

The inference that vitamin D and parathyroid hormone are both concerned in regulating the equilibrium which is believed to exist between the calcium and phosphate ions in the extracellular fluid and the crystals of a calcium-phosphate compound in the skeleton [6 7] may shed some light on related problems. It explains the hypercalcæmia which may be induced by very large doses of vitamin D (never adequately explained by the action of vitamin D on absorption of calcium), and it may account for the secondary hyperparathyroidism often seen in rickets and osteomalacia. If vitamin D normally contributes to the maintenance of the serum-calcium level, its deficiency would tend to lower the calcium content and stimulate the parathyroid glands, leading to the parathyroid hyperplasia seen in rickets,[8] and to the radiographic [9] and histological [10] manifestations of parathyroid overactivity reported in osteomalacia. In fact, such parathyroid overactivity is very probably responsible for the high phosphate-clearance observed in osteomalacia,[11] and so for the low serum-phosphate in this condition which cannot be attributed to malabsorption of phosphorus. But lack of vitamin D does not always set in train this course of events. Hypocalcæmic tetany is another familiar manifestation of this deficiency; but its precise relationship to rickets has never been fully understood. If rickets is regarded as a manifestation of secondary hyperparathyroidism, hypocalcæmia may legitimately be regarded as an indication of parathyroid insufficiency, particularly when—as is often the case—the content of inorganic phosphate in the serum is high. The reason for this parathyroid insufficiency is unknown.

Nutritional deficiency of vitamin D has become a rare cause of rickets and tetany, but both these conditions may arise in steatorrhœa. They are then indistinguishable from the corresponding conditions produced by nutritional deficiency (except in the dosage of oral calciferol which they need), and are commonly attributed to malabsorption of fat-soluble vitamin D,[12] though Dent [13] has suggested that there may be some additional metabolic disorder present. In a letter on p. 1086, Dr. Jackson suggests that steatorrhœa and hypoparathyroidism are significantly associated, and he draws attention to reported cases presenting both disorders. He cites the attractive suggestions of Salvesen and Böe [14] that patients with steatorrhœa may develop either osteomalacia or tetany according to the response of their parathyroids to hypocalcæmia, and he suggests that some particular significance should be attached to the apparently high prevalence of parathyroid insufficiency in steatorrhœa.[15] There may, of course, be evidence of endocrine insufficiency in steatorrhœa,[16] and possibly parathyroid insufficiency should be regarded as a particular manifestation of this general disorder; in fact, amenorrhœa and absent body hair were prominent features in Dr. Jackson's own case.[17] If, on the other hand, these patients are in fact suffering from a deficiency of vitamin D, it seems more reasonable to seek a single explanation for the tetany of steatorrhœa and that of nutritional avitaminosis D.

The hypothesis that the parathyroids either respond to hypocalcæmia and cause osteomalacia, or fail to respond and cause tetany, seems to be an oversimplification. Thus it fails to take into account or to explain the vital fact that tetany and rickets may be found in the same patient. This is true not only of nutritional vitamin-D deficiency, in which tetany is almost invariably associated with rickets, though rickets is only occasionally accompanied by tetany,[18] but also of the malabsorption syndrome.[19] In both types of vitamin-D deficiency,

1. Albright, F., Reifenstein, E. C. The Parathyroid Glands and Metabolic Bone Disease. Baltimore, 1948.
2. Ingalls, T. H., Donaldson, G. A., Albright, F. *J. clin. Invest.* 1943, **22**, 603.
3. Carlsson, A., Lindquist, B. *Acta phys. scand.* 1955, **35**, 53.
4. Barnicot, N. A. *J. Anat., Lond.* 1948, **82**, 233.
5. Barnicot, N. A. *Ibid*, 1951, **85**, 120.
6. See *Lancet*, 1955, ii, 183.
7. Copp, D. H. *Amer. J. Med.* 1957, **22**, 275.
8. Pappenheimer, A. M., Minor, J. *J. med. Res.* 1921, **42**, 391.
9. Davies, D. R., Dent, C. E., Willcox, A. *Brit. med. J.* 1956, ii, 1133.
10. Lang, F. J. *Beitr. path. Anat.* 1931, **87**, 142.
11. Nordin, B. E. C., Fraser, R. *In* Proceedings of Ciba Foundation Symposium on Bone Structure and Metabolism. London, 1956.
12. Bodansky, M., Bodansky, O. The Biochemistry of Disease. New York, 1952.
13. Dent, C. E. *Brit. med J.* 1956, ii, 1546.
14. Salvesen, H. A., Böe, J. *Acta med. scand.* 1953, **146**, 290.
15. Salvesen, H. A., Böe, J. *Acta endocr., Copenhagen*, 1953, **14**, 214.
16. Wintrobe, M. M. Clinical Hæmatology. London, 1956.
17. Jackson, W. P. U., Hoffenburg, R., Linder, G. C., Irwin, L. *J. clin. Endocrin.* 1956, **16**, 1043.
18. Hess, A. F. Rickets, Osteomalacia and Tetany. London, 1930.
19. Bloom, A. *Proc. R. Soc. Med.* 1955, **48**, 321.

however, it seems that whereas rickets may precede tetany, tetany rarely if ever develops into rickets.[18]

These observations can be reconciled if it is accepted that the parathyroid glands may become "exhausted." On this hypothesis, an indeterminate period of parathyroid overactivity may lead to rickets or osteomalacia, but may culminate in parathyroid failure and tetany. The two possible parathyroid responses postulated by Salvesen and Böe can be regarded as the two extreme examples, but between them there can exist every degree of parathyroid activity represented by different combinations of serum contents of calcium and phosphate. A normal serum-calcium with a low serum-phosphate suggests complete parathyroid compensation: a low serum-calcium with a high serum-phosphate, complete parathyroid failure. Between these two extremes, the development of rickets will depend on the product of Ca × P in the extracellular fluid, and the development of tetany on the absolute content of calcium ions.

The possibility remains that the hypoparathyroid state is more common in steatorrhœa than in nutritional vitamin-D deficiency, or that it differs in some other way in the two conditions. If Dr. Jackson can show this to be the case, his suggestion will be greatly strengthened.

THE ENZYME DEFECT IN GALACTOSÆMIA

Two years ago [1] we discussed the genetically determined inborn error of metabolism known as galactosæmia. Some of the questions raised then remain unanswered —for example, whether children with this metabolic error would be entirely protected from harm if they were kept on a lactose-free diet from birth. But another problem —the exact nature of the enzyme deficiency—has been solved. In 1955 Schwarz et al.[2] had taken the first step by showing that the red cells of galactosæmic children who had just had a milk feed contained an accumulation of galactose-1-phosphate, but not of glucose-1-phosphate. Therefore galactose was being metabolised to galactose-1-phosphate, but a stage in the conversion of galactose-1-phosphate to glucose-1-phosphate was imperfect.

This transformation involves three stages. First, galactose-1-phosphate combines with uridine diphosphoglucose to give glucose-1-phosphate and uridine diphosphogalactose. Second, uridine diphosphogalactose is transformed to uridine diphosphoglucose. Third, uridine diphosphoglucose reacts with inorganic pyrophosphate to give uridine triphosphate and glucose-1-phosphate. Kalckar et al. have shown in hæmolysates [3] and in liver homogenates [4] from patients with the disease that it is the enzyme for the first stage, galactose-1-phosphate uridyl transferase, that is missing.

It is useful to know that the enzyme defect may be shown in cord-blood cells immediately after birth, so that in families at risk affected infants may be identified and put on a lactose-free diet from birth. Holzel and Komrower,[5] in 1955, produced evidence that some of the parents, who are themselves heterozygous for the gene responsible for galactosæmia, had an abnormal galactose-tolerance curve. Unfortunately Kalckar and his associates [3] have not been able to detect any abnormality in the amount of galactose-1-phosphate uridyl transferase in parents.

It is a striking example of the uniformity of many biological processes in the animal kingdom that four mutant forms of the bacillus *Escherichia coli* are known with the same enzyme defect.[6] Three other galactose-negative mutants of the bacillus lack instead the enzyme galactokinase concerned in the first step of all—the conversion of galactose to galactose-1-phosphate—but these have as yet no human counterparts.

1. *Lancet*, 1955, ii, 77.
2. Schwarz, V., Solberg, L., Komrower, G. M., Holzel, A. *Biochem. J.* 1955, **59**, xxii.
3. Kalckar, H. M., Anderson, E. P., Isselbacher, K. J. *Biochem. biophys. acta*, 1956, **20**, 262.
4. Anderson, E. P., Kalckar, H. M., Isselbacher, K. J. *Science*, 1957, **125**, 113.
5. Holzel, A., Komrower, G. M. *Arch. Dis. Childh.* 1955, **30**, 155.
6. Kurahashi, K. *Science*, 1957, **125**, 114.

ATYPICAL ACID-FAST BACILLI

MANY investigators have isolated from patients strains of mycobacteria which, for want of a better name, are called "atypical acid-fast bacilli." These bacilli are not new,[1 2] but in recent years they seem to have been recognised much more commonly. In man they are associated with pulmonary lesions, often serious and progressive, which in every way resemble typical pulmonary tuberculosis [3]; but unhappily their response to most antituberculous drugs is poor.

It is not yet certain whether these organisms comprise a homogeneous group or several different types. They differ from typical tubercle bacilli not only in their drug-sensitivity pattern but also in being chromogenic, and in showing greater catalase activity, poor cord formation, a negative neutral-red reaction, and avirulence for guineapigs. Usually they can be distinguished from typical acid-fast saprophytes by a rather slower growth-rate, especially at room-temperature (though they grow faster than typical tubercle bacilli) and by the type of lesions in certain laboratory animals. Wolinsky et al.[3] found that in each of three cases of infection by these organisms in man, the strains produced orange or yellow pigment; but in two they did so only in light. Crow et al.[4] describe 69 such cases, in which the organisms seemed to fall into three main groups judged by growth on Löwenstein-Jensen medium. In 64 cases the strains produced smooth, slow-growing buff colonies which became orange as the cultures aged; in 3 the strains were more chromogenic but otherwise similar; and in 2 the strains gave rough colonies similar to those of *Mycobacterium tuberculosis* except that they grew much more rapidly—though not so rapidly as recognised acid-fast saprophytes.

Pathologically, according to Crow et al., these organisms give rise to lesions differing in no way from those due to typical tubercle bacilli; but the disease is less readily communicated: in none of their 69 cases was more than one member of a household known to be infected. On the other hand, the response to antituberculous treatment is disappointing: of 56 cases reviewed by Crow et al. only a third showed sputum conversion on chemotherapy.

These studies and others [5–7] make it clear that atypical acid-fast bacilli present a fairly serious problem. It can hardly be doubted that infections with these organisms have become more prevalent since chemotherapy has been widely used; and conceivably they represent mutants induced or selected by chemotherapy —a hypothesis that seems to be supported by the partial resistance of most strains to antituberculous drugs. Thus, incomplete treatment of tuberculosis due to drug-sensitive typical bacilli may carry the danger of fostering these drug-resistant atypical forms, though so far this has by no means been proved. Meanwhile infections with these atypical organisms should, it seems, be treated as are infections with typical bacilli; and, despite their seemingly lesser infectivity, public-health measures should be applied no less rigorously than is usual in tuberculosis.

1. Branch, A. *Tubercle, Lond.* 1933, **14**, 337.
2. Pinner, M. *Amer. Rev. Tuberc.* 1935, **32**, 424, 440.
3. Wolinsky, E., Smith, M. M., Mitchell, R. S., Steenken, W. jun. *Ibid*, 1957, **75**, 180.
4. Crow, H. E., King, C. T., Smith, C. E., Corpe, R. F., Stergus, I. *Ibid*, p. 199.
5. Timpe, A., Runyon, E. H. *J. Lab. clin. Med.* 1954, **44**, 202; see *Lancet*, 1955, ii, 758.
6. Wilson, G. C., Morton, D. E. *Amer. Rev. Tuberc.* 1956, **73**, 351.
7. Tarshis, M. S., Frisch, A. W. *Ibid*, 1952, **65**, 278, 289, 302.

Special Articles

METALLIC CORROSION IN ORTHOPÆDIC SURGERY

F. P. BOWDEN
C.B.E., D.Sc. Tasmania, Ph.D., Sc.D. Camb., F.R.S.

J. B. P. WILLIAMSON
Ph.D. Camb.

OF THE RESEARCH LABORATORY FOR THE PHYSICS AND CHEMISTRY OF SURFACES, DEPARTMENT OF PHYSICAL CHEMISTRY, CAMBRIDGE

P. G. LAING
M.B. Lond., F.R.C.S.

OF THE SCHOOL OF MEDICINE, UNIVERSITY OF PITTSBURG, PA.

WHENEVER metal is inserted in the human body it becomes subjected to the corrosive attack of the body-fluids. Venable et al. (1937) drew attention to this phenomenon and suggested that a simple means of reducing the risk of corrosion would be to avoid the use of more than one metal in any particular operation. Discussions of the dangers accompanying the insertion of "mixed metals," and descriptions of investigations carried out to discover a metal which could confidently be adopted as standard, have been published periodically throughout the last two decades. But, although this work is well known to many surgeons, the recent paper by Cater and Hicks (1956) shows that in some hospitals insufficient attention has been paid to this aspect of surgery. Until the basic principles put forward in a series of papers by Venable and Stuck some twenty years ago are clearly understood and accepted (and if necessary protected by an official standardisation of the materials used for implants), there is little point in taking precautions to avoid the secondary causes of corrosion and the possible tissue reactions which can result from them. The first step in preventing metallic corrosion in surgery must be the use of a single passive metal for all the components of an implant.

The physiological behaviour of the body during trauma and the subsequent healing processes create the environment within which the metal implant has to fulfil its purpose. The pH value and the redox potential will vary with time, and also from place to place on the surface of the metal. These variations cannot readily be controlled: but their effect could be minimised by the careful selection of the particular metal best suited to withstand these electrochemical conditions. Clearly the use of two different metals in a region with such a complex electrochemical nature is an invitation to disaster. Most metal implants are subjected to mechanical stress when fixed in the body; in many cases there may also be fretting between different components of the appliance. Both these phenomena can influence the corrosion of metal, and they too should be borne in mind when selecting the most suitable metal for use in orthopædic surgery. It would be dangerous, however, to believe that such a standardisation will solve all the problems created by the use of metals in orthopædic surgery. The insertion of "mixed metals" is by far the most important cause of corrosion, but it is by no means the only one. The factors which can influence the corrosion resistance of metals have been fully discussed by Evans (1946).

There is clear evidence that even when a single passivated metal is used, a tissue reaction is occasionally observed in the region surrounding the implant; and it is important that the need to select the metal must not obscure the complementary need for proper treatment of the implants both before and during insertion. Many metals derive their high resistance to corrosion from an impervious layer of oxide which protects them from the surrounding liquid. But such an insulating barrier is effective only so long as it remains intact. If it is damaged, corrosion will occur at the places where the metal and the liquid come into contact; the attack will continue unless the product of the electrochemical reaction is insoluble and is deposited at the corrosion site, thus making good the protective coating.

The special characteristic of stainless steels is that they are clothed in a protective film which in normal circumstances is self-sealing. In this respect they differ from the noble metals which are intrinsically inert. It is clear that the selection and use of a stainless steel will be vitiated if, during the operation, the passivating surface film is so damaged that the sealing process cannot re-form the protective layer before continuing corrosion is established. Any treatment which increases the chance of a breakdown in the passivity of the metal ought to be avoided whenever possible, and especially during the operation. The manner in which the implants are handled can have an important influence on their subsequent chemical behaviour.

The importance of the correct choice of tools should be appreciated. Experiments using radio-isotope techniques have shown that during an orthopædic operation small fragments of metal are plucked from the surface of the tools and become welded to the implant. These particles from the tool are buried with the appliance in the body.

The composition of the metal tools is usually different from that of the implant. There is evidence that such foreign fragments can initiate a reaction resulting in the corrosion of the buried metal. Analytical evidence supports this view: the concentration of metal ions in the tissues surrounding parts of the implant which have been handled by tools are many times higher than normal, even when there is no visible sign of corrosion or tarnishing: whereas the concentration in the tissues adjacent to unhandled parts of the same appliance are normal. A full account of these experiments has been given by Bowden, Williamson, and Laing (1955).

It has been suggested (Capener 1956) that surgeons and manufacturers should have official guidance in their choice of suitable metal for implants. It might be useful if this included recommendations on the methods of handling the implants, and on the nature and composition of the tools used for inserting them, so that their corrosion resistance shall not be needlessly impaired.

REFERENCES

Bowden, F. P., Williamson, J. B. P., Laing, P. G. (1955) *J. Bone Jt Surg.* **37B**, 676.
Capener, N. (1956) *Lancet*, ii, 1107.
Cater, W. H., Hicks, J. H. (1956) *Ibid*, ii, 871.
Evans, U. R. (1946) Metallic Corrosion, Passivity and Protection. London.
Venable, C. S., Stuck, W. G. (1947) The Internal Fixation of Fractures. Oxford. (This book gives a comprehensive bibliography up to 1946.)
— — Beach, A. (1937) *Ann. Surg.* **105**, 917.

PROFESSIONALISM AND BUREAUCRACY

IN his Winchester Address, given on May 15 under the auspices of the Winchester division of the British Medical Association, Mr. GRAHAM HUTTON began by considering what has been happening in all kinds of human societies during "this terrible but exciting 20th century."

THREEFOLD CHANGE

1. *Technical.*—The techniques of control over Nature have immeasurably multiplied and accelerated, and it is good that human powers over inhuman powers are being so rapidly increased. But it is bad that increased human power is used—or abused—to stress human beings beyond their normal tolerances, or to frustrate their natural modes of expression and development, or to compel them to behave as machines.

2. *Political.*—Whereas the course of last century, all over the world, was liberal, in humanistic terms, the course of the 20th century has been towards more and more collective restraint of individuals. Everywhere the State has steadily increased its power over individual lives, and in almost every walk of life. Because of the first or technical change, this second or political change has brought benefit to millions in many nations: it has permitted the removal of old evils. But, both in democracies and in dictatorships, power over the individual and the family has been concentrated in a more and more centralised form of State apparatus.

"We realise that in our own country and society today economic, professional, trade-union, legal, travel, and other freedoms are not what they were. They are narrower, not at the administrative centres of these sectors of life, but on the periphery where the individual members live and operate. Even apart from, and under, the centralising political power of the State, these other sectors of individual life—in business, trade-unions, professions, vocations, sport, commercialised pleasures and leisures, and media of publication and radio communication—are all of them more centralised, more collectively organised in larger administrative units. . . ."

As the first or technical change has shrunk the whole world and crammed the human race cheek by jowl, so has the second or political change unfolded everywhere—the concentration of vastly enhanced social or political power in the hands of the few; and the once-vaunted "rule of Law" has given way everywhere to the contemporary rule of laws and regulations affecting more and more of individual life.

3. *Specialisation.*—The third change is an ever-deepening, ever-narrowing specialisation which further weakens the powers, potentials, and freedoms of the citizen. The individual—learner, researcher, operative, technician, professional man, trade-unionist, or manager—sees his own mastery of only a little part of a widening field becoming smaller and smaller, and himself becoming ever more dependent upon the results of other people's work, which he cannot understand or control.

So universal is this third change in mankind's social process that precisely the same kind of complaints about it arise in America, in Russia, in India, in Africa—in school and university and other training curricula, in religions, castes, social classes, income brackets of all levels, and so on. The burden of complaint is the same—that distinguishing individualities are tending to be ironed out, that differentials and varieties are being flattened, and that frustration of human potentials follows specialisation. Then, through such frustration, bad social outbreaks occur: the system of law and custom rights and duties, sentiments and beliefs and values begins to lose its binding force. Either as individuals or as functional or other groups, men begin to rebel, to become "anti-minded," against their own society. Today this phase—the era of social revolution—is world-wide for the first time.

RUSSIAN LABORATORY

Perhaps the most significant event of the post-war era, Mr. Hutton thought, will prove to be the working-out of these revolutionary social changes in Communist Russia. Western and other countries can learn much from what has happened inside the Russian social laboratory during the past decade or two.

At its beginning, forty years ago, Russian society was dedicated to equality, and it soon took away all powers and privileges of trades-unions, professions, vocations, and other self-governing voluntary and functional groupings. But because of the technical needs of all society everywhere (in our time as in Plato's) a new set of groupings, orders, castes, classes, and functional élites speedily came about—nearly all of them necessarily organised on the lines of the former professional and other functional groups. As modern techniques advanced—in economics, science, medicine, the arts—it was the *professions*, not merely the State's agents or functionaries, who gathered esteem, powers, and privileges.

One feature of the convulsions in Russia and other Communist lands during the past three years needs to be noted for its long-term significance. It is that the uprush of protest against flattening and standardisation by the omnipotent State, against unqualified egalitarianism, and against the tyrannies of an all-pervasive bureaucracy have occurred in the ranks of the experts—the people with long-acquired and long-trained vocations whom a modern society needs more and more. It is among this younger generation of Communists—among the experts and artists, the technicians, and the professional persons above all—that the ferment of dissatisfaction with the bureaucracy is greatest.

DIFFERENTIALS

"At both the superficially seeming opposite poles of world politics today, in North America and in Soviet Russia, really substantial differential rewards for differential responsibilities and differential expertnesses are the order of the day," said Mr. Hutton; "while here in British society, which is lagging behind those in material progress and mixed-up between them in its social and political organisation, our skilled workers moan about the erosion of their 'differentials' in wages, the salaried folk can complain of the same process, and the folk of technical prowess and professional responsibility are the most savagely penalised and discriminated against of all."

The material sacrifices due to the last war have fallen, net and on balance, upon only about one-fifth of the British people, which includes three-twentieths who are the old and retired at all levels of income (some very poor and on National Assistance) and all the skilled, trained, and responsible paid leaders of the nation. Just as an examination and a justification of equality of treatment for everybody is long overdue in our political and social system, so is an examination of the distribution of rewards for responsibilities. "Somewhere around the current figure of £1000–£1500 a year gross for a bread-winner—no matter what his training or responsibilities, or how big his family, or what his hours of work or conditions of service—British society seems to shut up shop in consideration of him."

Looking at the needs of medicine, of the expanded atomic energy programme, of the highway and railway networks, of slum clearance, of education in all its forms, and of new equipment for all our industries, "we shall better appreciate our overriding need not to penalise, but positively to stimulate and increase differential rewards for, any and every citizen who can command such enhanced rewards in virtue of his abilities, responsibilities, and social contributions."

"What we have undergone in the past eleven post-war years, in a world of technical revolution, has merely been a revolution in the apparatus of the State and in its administration. We have had no post-war revolution of thought and ideals and imagination."

THE PROFESSIONS

If British professional bodies are to play their part in the reshaping of our people's thought and the reform of our national institutions, they must first be sure that on balance what they propose to do will primarily benefit the community or communities they serve.

"The justification for a profession, which guards its own standards of training, can only be that in so doing it constantly proves its contributive power to the community is kept at top pitch. Any profession will lapse in public esteem if either it fails to do that, or fails to make public why the State or some other factor beyond its power prevents it from doing it.

The great power of our professions still resides in their vocational mission, their safeguarding of training and education, and their rôle—quite apart from their particular skills—in turning out the well-rounded, socially adjusted, contributory and responsible leaders of the nation in all its walks of life. It is perhaps this last rôle which is so often overlooked in our land today. Without wise leaders, without a widely trained and humanistic élite, any society on earth, both today and in the even more technical complexity of the future, will perish. It is as much the function of our professions—and pre-eminently of yours—to turn out members of such a national élite, as it is to turn out technically qualified young men who are certified as able to perform certain skills adequately. The professions would gain, I think, if they were to emphasise that aspect, in season and out of season; and, above all, if they were to see, in their educational curricula which still remain largely under their own safeguarding, that they did not merely turn out technically adequate young men, but young men who were in addition humane, rounded, and adjustable to a rapidly changing social context."

Contemplating the hectic experimentation in North America at one extreme and in Russia at the other, we need not (concluded Mr. Hutton) despair or repine. Technically it is well within our scope to succeed, in any sector of social life, as well or better. There is no economic reason why we should not. But if we bring it off, it will primarily be due to leadership; and that must still come largely from our professions. "It is therefore up to them to set their own standards, and then to fight for them until they prevail. There is nothing wrong in that for the nation. On the contrary, I think this nation has everything to gain from it."

REGIONAL HOSPITAL BOARDS AND BOARDS OF GOVERNORS OF TEACHING HOSPITALS

THE Minister of Health has appointed, or reappointed, the following as chairmen of boards. New appointments are indicated with an asterisk.

Leeds Regional Hospital Board.—Major J. C. Hunter, M.C.

South West Metropolitan Regional Hospital Board.—A. G. Linfield, O.B.E., J.P.

Oxford Regional Hospital Board.—Sir George Schuster, K.C.S.I., K.C.M.G., C.B.E., M.C.

Birmingham Regional Hospital Board.—* E. W. Thompson, M.A., J.P.

United Newcastle upon Tyne Hospitals.—* Sir Walter Drummond.

United Leeds Hospitals.—Sir George Martin, K.B.E., LL.D., J.P.

United Sheffield Hospitals.—Alderman A. Ballard, C.B.E.

United Cambridge Hospitals.—Roger H. Parker, M.C., D.L., M.A.

United Oxford Hospitals.—Sir David Lindsay Keir, M.A., LL.D.

United Cardiff Hospitals.—Alderman Thomas Evans, C.B.E., J.P.

United Birmingham Hospitals.—Evan A. Norton, M.A.

St. Bartholomew's Hospital.—Sir George Aylwen.

London Hospital.—Sir John Mann.

University College Hospital.—Sir Alexander Maxwell, K.C.M.G.

Middlesex Hospital.—Lord Astor of Hever, D.LITT., J.P.

Charing Cross Hospital.—Lord Inman, P.C., J.P.

St. George's Hospital.—Viscount Ingleby.

Westminster Hospital.—Lord Nathan of Churt, P.C., T.D., F.S.A., D.L.

St. Mary's Hospital.—Edgar E. Lawley.

Guy's Hospital.—Lord Cunliffe.

King's College Hospital.—Marquess of Normanby, M.B.E.

St. Thomas's Hospital.—Sir Arthur Howard, K.B.E., C.V.O., D.L.

Hammersmith, West London, and St. Mark's Hospital.—Sir Desmond Morton, K.C.B., C.M.G., M.C.

Royal National Throat, Nose and Ear Hospital.—Ernest Taylor.

St. John's Hospital for Diseases of the Skin.—J. A. M. Ellison-Macartney.

The Hospitals for Diseases of the Chest.—Sir John Gilmour.

Royal National Orthopædic Hospital.—Sir Henry Floyd, C.B., C.B.E.

National Heart Hospital.—J. M. Oakey, M.C., D.L., J.P.

St. Peter's, St. Paul's, and St. Philip's Hospitals.—Laurence Bevan.

Royal Marsden Hospital.—J. M. Wallace.

REGIONAL HOSPITAL BOARDS

The following doctors have been appointed or reappointed to the boards. They will hold office till March 31, 1960.

Newcastle.—C. N. Armstrong, R. E. Jowett, R. S. Venters.

Leeds.—W. A. Hyslop, G. Whyte Watson.

Sheffield.—G. H. Gibson, J. L. A. Grout, C. S. O'Flynn.

East Anglia.—A. Leslie Banks, K. J. Grant.

North West Metropolitan.—E. C. Warner, Katharine Lloyd-Williams, *F. C. Wilkinson.

North East Metropolitan.—T. Rowland Hill, J. Arthur Moody, R. W. Reid.

South East Metropolitan.—Sir William Kelsey Fry, V. F. Hall, W. G. Masefield, * H. W. L. Molesworth.

South West Metropolitan.—A. Lawrence Abel, Sir Geoffrey Todd.

Oxford.—C. V. Gledhill.

South Western.—R. J. Brocklehurst, L. C. Hill, A. V. Neale.

Wales.—J. P. J. Jenkins, A. Trevor Jones, Emyr Wyn Jones, E. K. Roy Thomas.

Birmingham.—J. H. Sheldon, A. P. Thomson.

Manchester.—V. F. Lambert, R. W. Luxton, Miles Parkes, Sir Harry Platt.

Liverpool.—W. M. Frazer, H. L. Sheehan.

BOARDS OF GOVERNORS

The following doctors have been appointed or reappointed to boards of governors. They will hold office till March 31, 1960.

St. Bartholomew's Hospital.—Charles Harris, J. Basil Hume, E. G. Tuckwell.

London Hospital.—J. Graham, G. T. Hankey, * William Evans, * Dorothy Russell.

Royal Free Hospital.—Gladys Hill, Katharine Lloyd-Williams, Margaret MacPherson, * Una Ledingham.

University College Hospital.—Sir George MacRobert, Wilson Smith, * Sir James Kilpatrick.

Middlesex Hospital.—* A. J. B. Goldsmith, * C. A. Keele, * B. R. M. Johnson, * D. H. Patey.

Charing Cross Hospital.—D. H. Campbell, E. Grundy, H. G. E. Williams, * Norman Tanner.

St. George's Hospital.—C. Bowdler Henry, Rodney Smith, * H. W. Gordon.

Westminster Hospital.—A. Lawrence Abel, H. E. Harding, Edward Stanley Lee, R. J. V. Pulvertaft.

St. Mary's Hospital.—A. G. Cross, Robert Cruickshank, G. B. Mitchell Heggs, Leonard Simpson, * Denis Brinton, * W. D. W. Brooks.

Guy's Hospital.—Maurice Campbell, Sir William Kelsey Fry, * G. F. Gibberd.

King's College Hospital.—H. L. Glyn Hughes, Sir Cecil Wakeley, * Wilfrid Sheldon.

St. Thomas's Hospital.—T. Pomfret Kilner, Sir Max Page, A. J. Wrigley.

Hammersmith, West London, and St. Mark's Hospitals.—R. Cove-Smith, Sir Allen Daley, Cuthbert Dukes, Sir Francis Fraser.

Hospital for Sick Children.—G. H. Newns, Bernard Schlesinger, D. Innes Williams, * R. E. Bonham Carter, * J. A. Scott.

National Hospital for Nervous Diseases.—Sir Russell Brain, J. St. C. Elkington, M. Kremer.

Royal National Throat, Nose and Ear Hospital.—J. C. Hogg, G. H. Howells, * T. V. L. Critchlow.

Moorfields Hospital.—* G. G. Penman.

Bethlem Royal and Maudsley Hospitals.—C. P. Blacker.

St. John's Hospital for Diseases of the Skin.—Janet Aitken, S. Cochrane Shanks, * L. Forman.

Hospitals for Diseases of the Chest.—Sir Russell Brock, J. L. Livingstone, K. Robson, Vernon Thompson.

Royal National Orthopædic Hospital.—C. H. Lack, R. Nassim.

National Heart Hospital.—H. A. Bulman, * T. F. Cotton.
St. Peter's, St. Paul's, and St. Philip's Hospitals.—A. R. C. Higham, * H. G. Hanley.
Royal Marsden Hospital.—P. E. Thompson Hancock.
Queen Charlotte's and Chelsea Hospitals.—H. G. E. Arthure, J. B. Blaikley, Charles Newman.
Eastman Dental Hospital.—R. A. Broderick, Sir William Kelsey Fry.
United Newcastle upon Tyne Hospitals.—C. N. Armstrong.
United Leeds Hospitals.—Digby Chamberlain, * A. S. Johnstone.
United Sheffield Hospitals.—John Wilkie, * J. C. Anderson.
United Cambridge Hospitals.—Janet Bottomley, S. H. Walford.
United Oxford Hospitals.—L. K. Ledger, A. R. H. Williamson, * R. G. Macbeth, * J. A. Stallworthy.
United Bristol Hospitals.—R. J. Brocklehurst, T. F. Hewer, * C. D. Evans, * A. Miller.
United Cardiff Hospitals.—Leonard Howells, * Hugh Harley.
United Birmingham Hospitals.—B. M. Wilmott Dobbie, F. A. R. Stammers.
United Manchester Hospitals.—W. I. C. Morris, Sir Harry Platt, * J. F. Wilkinson.
United Liverpool Hospitals.—W. M. Frazer, C. A. Wells, * E. Wyn Jones.

TERMINOLOGY OF HEREDITARY HÆMOGLOBINOPATHIES INVOLVING HÆMOGLOBIN VARIANTS

THE Colonial Medical Research Committee's Working Party on Sickle-cell Trait and Sickle-cell Anæmia * has issued the following recommendations which, it says, are based on immediate practical requirements rather than on fundamental theoretical considerations, and are put forward at the present time solely with the aim of discouraging the growth of ambiguous systems of terminology until an agreed international system has been devised.

General

(*a*) The term "sickle-cell disease" should be used to denote any pathological condition which is, in part, attributable to sickling of the red cells. The term "sickle-cell anæmia" should be reserved to denote the presumably homozygous state. Its use is (strictly) conditional upon the demonstration of homozygosity from family studies.

(*b*) Fœtal hæmoglobin is excluded from the present discussion of terminology, though its persistence in varying degree is an often-observed feature of states involving the hæmoglobin variants. Statements regarding its occurrence should be made as part of the biochemical findings.

(*c*) The Working Party appreciates the desirability of having a complete statement of the Hb variants actually present, preferably in order of decreasing proportions, leaving the clinician to decide if an actual (or potential) pathological situation needs to be described, and the geneticist to state how the observed combination of Hb variants has arisen. The Working Party also appreciates the undesirability of using a terminology with genetic implications in the absence of family studies.

(*d*) The term "hæmoglobinopathy" should be used to denote a condition in which the production of normal adult hæmoglobin (Hb–A) is partly or wholy suppressed and it is partly or wholly replaced by one or more hæmoglobin variants, which may include fœtal-type hæmoglobin (Hb–F).

Specific

(*a*) The term "sickle-cell" should be hyphenated when used as an adjective.

(*b*) Excluding Hb–F from consideration, the biochemical state involving Hb–A and any other one hæmoglobin variant (Hb–X) should be described as "Hb–X trait."

(*c*) The term "disease" and not the term "anæmia" should be used generally to denote pathological conditions associated with hæmoglobin variants.

(*d*) The term "thalassæmia" should be retained because the genetic variants of thalassæmia present themselves as such. These variants should be described as "Hb–C/thalassæmia," "Hb–E/thalassæmia," &c. The term "thalassæmia" should be used rather than the terms "Cooley's anæmia," "microcythemia," &c. The qualifying terms "major" and "minor" are in practice used to denote the presumably homozygous and heterozygous states respectively, but their use in this way is (strictly) conditional on supporting evidence for the nature of the genotype from family studies.

(*e*) A morbid condition, not presenting itself as sickle-cell disease or as a variant of thalassæmia, but produced by any one or two Hb variants, in the absence of Hb–A, should be described as a "disease"—e.g., "Hb–C disease," "Hb–C/Hb–D disease" (hypothetical). It is appreciated that some of the possible combinations are not yet known to produce morbidity in adults.

Examples of Known Hæmoglobin Combinations

A	Normal adult
A + F	Infants
A + F	Thalassæmia
S + F	Sickle-cell anæmia
A + S	Sickle-cell trait
A + S + F	Sickle-cell/thalassæmia
C (+ F)	Hb–C disease
A + C	Hb–C trait
A + C + F	Hb–C/thalassæmia
S + C (+ F)	Sickle-cell/Hb–C disease
D	Hb–D disease
A + D	Hb–D trait
S + D (+ F)	Sickle-cell/Hb–D disease
E (+ F)	Hb–E disease
A + E	Hb–E trait
E + F (+ A ?)	Hb–E/thalassæmia
G	Hb–G disease
A + G	Hb–G trait
A + I	Hb–I trait
A + H	Hb–H trait
A + J	Hb–J trait

In the above examples, the hæmoglobin variants given in parentheses are not always found.

* The members of the Working Party are: Prof. A. W. Woodruff (chairman), Dr. A. C. Allison, Prof. P. C. C. Garnham, Dr. H. Lehmann, Dr. R. Lewthwaite, Prof. B. G. Maegraith, Dr. A. E. Mourant, Dr. A. B. Raper, Dr. J. C. White, and Dr. G. H. Beaven (secretary).

Public Health

Health in Scotland

LAST year in Scotland the infant-mortality rate fell to the lowest level on record and there was evidence of continuing gain in the health of children (in Glasgow and Edinburgh, boys aged 13 in 1955 were a stone heavier and 4 inches taller than the boys of 1913); but the death-rate in men aged 45–64 increased slightly.[1] In this group the dangers were from lung cancer, bronchitis, and heart-disease—particularly coronary thrombosis, which was responsible for 15·6% of all deaths. Physicians and surgeons had a death-rate from coronary thrombosis 73% above the average, and other professional and managerial groups had similarly high rates. An interesting table in the report on the year compares the death-rates from cancer at various sites in 1931–35 with those in 1953–55. At most sites the rates were about the same in the two periods. At some (especially the lymph-glands) there was a fall, at others (such as the urogenital tract in men, the cervix in women, and the pancreas in both sexes) a slight rise; but in the lung (including trachea and bronchi) the rate had risen threefold in women and sevenfold in men. In the brain the rises were surprisingly high—ninefold in women and twelvefold in men—and this is attributed in the report to better diagnosis.

The report emphasises that simple trends of death-rates have lost some of their significance as indices of the nation's health, and more account should be taken of sickness and disablement, though information here is insufficient. The greatest losses of time from work were caused by respiratory tuberculosis, psychosis and neurosis, bronchitis and pneumonia, and rheumatism. A two-year mass-radiography campaign is now in progress.

The numbers of hospital admissions and discharges, of bottles of blood transfused, of outpatient attendances, and of nurses employed all continued to rise. Eight major hospital schemes were under construction. Voluntary admissions to mental hospitals numbered 6585 (compared with 3975 in 1950). The report expresses

1. Report of the Department for Health for Scotland, 1956. H.M. Stationery Office. Pp. 147. 5*s*. 6*d*.

concern at the rise in the number of prescriptions for phenobarbitone (2 million, or over 10% of all prescriptions) and other sedatives, and in the number of deaths attributed to such drugs (77, compared with 18 in 1948). Some of these deaths were suicidal, some accidental. Accidents continue to be a major cause of death and disability; in 1955, 192 babies under a year died by accident and only 35 from all infectious diseases (including tuberculosis but not pneumonia). There are many more serious accidents at home than at work or on the roads; in 1950–55, 48% of the fatal accidents in males and 85% of those in females were at home. In 1955 there were 1120 deaths in Scotland from home accidents, besides many severe injuries. Most of the fatalities were in children under 5 years or people over 65. The biggest hazards for the old were falls and accidental gas-poisoning; for infants, suffocation (in bed or by inhalation of food). Deaths from burns and scalds, and from poisoning by solids and liquids, were next in order of frequency. If anything, the accident-rate was increasing, and it is good to learn that research on these matters is being done in Scotland, and that home accidents are "now regarded as a problem within the sphere of local authorities."

Poliomyelitis

In the week ended May 11, uncorrected figures for poliomyelitis notifications were (previous week in parentheses): paralytic 39 (35), non-paralytic 30 (25), total 69 (60). The figures remain well above the seasonal average. From 1948 to 1956 the highest previous total for the corresponding week of the year was 36 (in 1953). The total number of cases this year (up to and including the 19th week) is 825; the highest corresponding figure in 1948–56 was 649 in 1950. Last year the total at this stage was 480. The districts particularly affected include Barnet (66·3 cases this year per 100,000 population), Stevenage (49·9), Colchester (43·6), and Tendring (near Colchester) (40·7).

Suspected Smallpox

A soldier stationed at Perham Down, Wiltshire, has been taken to an isolation ward in Reading because he may have smallpox.[1] The unit affected is the 39th Heavy Regiment, Royal Artillery. 8 men who had been living in the same room are in an isolation ward in the camp and between 400 and 500 men of the unit are confined to camp for revaccination. Reports suggest that the soldier has not been abroad recently.

More Dental Decay in Children

In his report for 1956, Dr. R. G. Davies, principal school medical officer for Huddersfield, speaks of the "very regrettable" increase in the incidence of dental decay among younger children. With a decrease, or the possibility of a decrease, in the number of dental officers, he added, it was easy to see that restorative dentistry would not be able to cope with this trend if it continued. The solution would have to be found not in extractions or even in conservative treatment but in some means of preventing dental decay. Unless methods such as fluoridation proved a short cut, the only answer lay in the education of parents and children in the prevention of dental disease.

B.C.G. Vaccination

The Research Defence Society has produced a pamphlet[2] setting out the answers to the questions that most parents ask about B.C.G. vaccination. The pamphlet explains why and how vaccination is performed in this country and says firmly, in assessing the vaccine's effectiveness, "it is no longer possible to doubt the usefulness of B.C.G. vaccination." Questions are also answered about the preparation and safety-testing of the vaccine.

1. *Times*, May 21, 1957.
2. B.C.G. Vaccination Against Tuberculosis. Conquest pamphlet no. 2. Price 3*d*., from the Research Defence Society, 11, Chandos Street, Cavendish Square, London, W.1.

In England Now

A Running Commentary by Peripatetic Correspondents

IT is odd that, though there are universities, post-graduate schools, lecturers, and textbooks galore devoted to the training of a consultant, there is no theoretical training for the thorniest obstacle of all—the selection committee's interview. Fortunately benevolent officialdom has recognised this, and supplies unlimited practical experience.

Thus, everyone knows that the post of consultant omphologist to Slumtown will go either to Bloggs, aged 43, with seventeen relevant letters after his name, and who has written two books, or else to Snooks, aged 41, with only fourteen letters and one book to his credit, but who is well favoured locally, and thought to be a promising young man. Despite this, McGregor, Smith, Jones, and O'Hara, mere striplings in their late 30s, will be summoned from the four corners of the kingdom. They will be senior registrars, usually laughingly called "transitional," and though they spend the rest of the year on an income which keeps them a bare fraction from the breadline, officialdom suddenly pretends to believe that they lead a champagne-and-caviare existence, and would refuse to come unless brought first-class. So there they are in their best blue suits, only distinguishable by the slight fraying at the cuffs from all the other people who travel first-class on expense accounts.

At the interview the questions are as unchangeable as the signs and symptoms of appendicitis, so that there is plenty of scope for textbook coverage: "What interests have you outside medicine?" "As an omphologist, what do you consider should be your relations with the Xiphisternist?" "Is there any particular branch of omphology in which you are interested?" and so on. These questions are so standard that publication of an unusual one would be as interesting as the report on a case of nagana on St. Kilda. The taxpayer would be saved a lot of money if this routine information were available in print, but until some enterprising author appears, we shall have to continue our little trips, even though we are only 37 and have a bare eleven letters to our name.

* * *

Why don't I keep my big mouth shut? Since birth I have been 100% tone-deaf: my nursemaid winced at the discords, the kindergarten mistress asked me not to sing in the carols, the French master tore his hair. All in vain, Hi-Fi is lost in the ataxic cilia of my cochleæ. Consequently all foreign languages are beyond me. I haven't a clue what all those mouthings mean without the explanatory manual gesticulations. Thank Heaven most of the world speaks English and seems to get a kick out of airing it to provide my material comforts. But when in Rome, or Stockholm, or Oslo, I really do try to merge into some of their less exotic background habits. On a visit to a large camp of young people I was invited to dine at the top-table on the first evening. With punctilious courtesy we stood behind our chairs until the whole company was assembled in the dining hall. The Commandant gave three sharp raps on the table with his knife, and spoke a couple of dozen words in Norwegian. Everyone bowed their heads and looked most solemn. I said "Amen" rather loudly and sat down. It seemed the obvious way of joining my hosts in spirit, but the top-table looked distinctly startled. For want of anything better as an opening conversational gambit, I leaned across to our interpreter and enquired if the Commandant's words were the usual form of Norwegian grace. When the howls had died down, I gathered the horrible truth of his translation "If you want any beer you must buy it yourselves."

* * *

Samples of the latest tranquilliser reached Singapore, appropriately enough, the same day as the news of the success of the Singapore "Merdeka" Mission to London. They lay on my desk until Maundy Thursday when I packed my bag for the annual general meeting of the Malaya branch of the B.M.A., held this year in Kuala Lumpur.

The journey north was delightful and we made excellent time until we reached a check point at Gemas, at the

beginning of one of the "food denial areas" which have been so successful in starving the bandits out of the jungle. Here I reported I had two apples, but was prepared to jettison them if they were prohibited. No, a reasonable quantity of fresh fruit was permitted, but could I please produce them for inspection? I opened my bag, but most of my interest was taken up by the very thorough examination of the car in front where a tin of sardines had just been produced in triumph from under the hubcap of a rear wheel. My attention was drawn back sharply to my own bag when the examining Gurkha soldier asked "What is this?" holding out the samples. I'm not an expert Malay scholar at best, and in any case I doubt if even the director of the new Agency for Malay Language and Literature has got round to inventing a Malay word for "tranquilliser" yet, so I told him it was headache medicine. A conference was held with a Malay policeman and a Malay civilian and they became so grave that even the finder of the tin of sardines seemed to think that his success had been eclipsed.

The inevitable Job's comforter in the car behind told her companion in a loud voice about a friend of hers who had been fined $500 for having "been caught with a bottle of aspirin," and that "everyone knows that the Communists in the jungle are very short of drugs." My visions of a happy Easter weekend with my colleagues were fading. Then the Gurkha said "Ini obat banya sallah, Tuan." I translated this literally as "This is very bad medicine, Sir" and was prepared to agree, abandon it, and go on my way, but apparently it was the possession of it without a permit that was so serious. I had to be taken before the assistant district officer to have my fate decided.

A long interview followed in which I was able to establish my identity as a medical practitioner by the production of a number of passes which authorise me to enter military areas and the harbour board area, and to inspect houses and buildings under the municipal ordinance, which I had regarded for years as nuisances because they clutter up my wallet and were never required. Finally I was given a "Permit for the Movement of Goods between the hours of 6 A.M. and 7 P.M." with everything on it deleted except item 17 "Drugs," and that was endorsed "2 Packets Samples."

This is my first experience of tranquillisers, and, as far as I am concerned, they did their best to upset the tranquillity of a lovely day. I was careful to dispose of them before setting out for the return journey to Singapore.

* * *

A discussion of the French cave-paintings led me to undertake a small study of wall-work in the West. Virtually everybody has come to this fast-growing Calgary from some other place, and where local roots seldom go deep the citizen is rare indeed who can say that his grandfather was born here. Therefore walls carry material that indicates the origins, ambitions, and masonic degrees of the people. In this land where everybody can read-and-write but so few can truly read, it is plain that little Johnny will go far when his parents have posted by his bedside the certificates of progress at school from grade 1 to grade 2, and then that from grade 2 to grade 3. Only the other day I visited a small boy who lay in a big bed, at the head of which I saw the neatly framed certificate of the marriage of his parents.

I am devoting a special section of my study to the offices of doctors. In a Province where the Pioneer is a man of such stature in the community that he is almost a Senator, the sign of special note in the offices of the small and diminishing number of doctors who were here before the establishment of the Province in 1905 is the arms of the North West Territories on the diplomas of registration with the College of Physicians and Surgeons of pre-history. On the other hand a non-pioneer doctor of my acquaintance shows to the world, by means of a small certificate on his wall, that he once attended a course in field hygiene with the R.C.A.M.C.; and another has put up the citation of a mention-in-despatches during the campaigns of a decade and a half ago.

* * *

Equality of opportunity has reached high levels in America. All milk is delivered homogenised; now nobody can take the cream off the top.

Letters to the Editor

STEATORRHŒA AND HYPOPARATHYROIDISM

SIR,—Dent et al.[1] have recently noted secondary hyperparathyroidism in cases of osteomalacia caused by steatorrhœa, confirming Albright's view [2] of the relationship between the two conditions. But there may be a connection between steatorrhœa and *hypo*parathyroidism. Steatorrhœa usually causes a deficient absorption of phosphorus as well as calcium, and this may lead to a lowered serum-inorganic-phosphate level and osteomalacia. The elevated serum-phosphate reported in other cases of steatorrhœa is, therefore, unexpected and needs an entirely different explanation.

Bennett et al.[3] described the syndrome of "idiopathic steatorrhœa" and remarked that in 5 of their 15 cases the serum-phosphorus was above 5 mg. per 100 ml.; in 1 case it was 6·3 mg. They offered no explanation, beyond the unqualified remark that secondary hypoparathyroidism might have been present.

Colin-Williams [4] reported a case of idiopathic hypoparathyroidism in a boy of 6 years with papillœdema and generalised moniliasis. Steatorrhœa became apparent at the age of 5. Tetany with low serum-calcium developed a year later, when the serum-phosphate reached 10 mg. per 100 ml. There was a good response to parathyroid hormone (Ellsworth-Howard test). The duodenal juice contained normal amounts of trypsin. Renal functions were unimpaired. Rickets did not develop and the serum-alkaline-phosphatase was estimated to be 10 Bodansky units. The patient's brother was said to suffer from the "cœliac syndrome."

Lowe et al.[5] reported the findings in a young girl who had tetany from birth with low serum-calcium and a high serum-phosphorus level (up to 7 mg. per 100 ml.). She had steatorrhœa (with only 65% fat absorption) associated with anæmia, ecchymoses, increased prothrombin-time, raised alkaline-phosphatase, and low serum-vitamin-A. Pancreatic-enzyme production was apparently depressed, but aspirated duodenal juice was normal when the test was repeated later. There was no response to injection of an active preparation of parathyroid hormone. On the other hand there were none of the specific skeletal abnormalities associated with pseudo-hypoparathyroidism. Ectodermal dystrophies, of the variety produced by prolonged hypocalcæmia, appeared later.

Liefer and Hollander [6] reported the case of a man of 20 who had had idiopathic hypoparathyroidism for ten years, and "diarrhœa" for eleven years. They diagnosed steatorrhœa (no fat-balance data are given), with normal vitamin-A tolerance, normal glucose tolerance, and normal pancreatic enzymes. The serum-inorganic-phosphorus in several estimations lay between 5 and 12 mg. per 100 ml. The response to parathyroid hormone was good. The urine calcium output was around 200 g. in twenty-four hours, with a serum-calcium of only 5·9 mg. *Salmonella panama* was isolated from the patient's stool and biliary tract. Addison's disease developed later.

Salvesen and Böe [7 8] describe a boy of 8 who had had moniliasis of skin, nails, and mouth from the age of 6 months. He had steatorrhœa, with 82 g. of fat in a single day's stool. The serum-calcium varied from 5·0 to 8·4 mg. per 100 ml. and the inorganic phosphorus from 5·45 to 6·5 mg., with a single reading of 10·2 mg. Though no further evidence is produced in favour of a diagnosis of idiopathic hypoparathyroidism, the well-known association of the condition with moniliasis makes this diagnosis very probable. *Candida albicans* was isolated from the stool, and moniliasis of the small intestine was suggested as the cause of the steatorrhœa.

1. Davies, D. R., Dent, C. E., Willcox, A. *Brit. med. J.* 1956, ii, 1133.
2. Albright, F., Reifenstein, E. C. The Parathyroid Glands and Metabolic Bone Disease. London, 1948.
3. Bennett, T. I., Hunter, D., Vaughan, J. M. *Quart. J. Med.* 1932, **1**, 603.
4. Colin-Williams, C. *Pediatrics, Springfield, Ill.* 1950, **5**, 998.
5. Lowe, C. U., Ellinger, A. J., Wright, W. S., Stauffer, H. M. *J. Pediat.* 1950, **36**, 1.
6. Liefer, E., Hollander, W. *J. clin. Endocrin.* 1953, **13**, 1264.
7. Salvesen, H. A., Böe, J. *Acta med. scand.* 1953, **146**, 290.
8. Salvesen, H. A., Böe, J. *Acta endocr., Copenhagen*, 1953, **14**, 214.

A patient discussed in a conference [9] had hypoparathyroidism, and no parathyroid tissue was found at autopsy. Steatorrhœa was mentioned as an incidental finding.

MacGregor and Whitehead,[10] while examining the evidence for two separate parathyroid hormones, remarked on 2 cases of steatorrhœa with tetany and with failure to respond to parathyroid hormone. In 1, a man of 30, the serum-calcium was 6·2 mg. and serum-inorganic-phosphorus 6·3 mg. per 100 ml. There were 11 g. of fat per day in the stool. The intravenous parathormone (Ellsworth-Howard) test was negative, and there was no response to intramuscular parathyroid extract (150 *U.S.P.* units a day for four days).

Our own patient [11] was a woman of 32 with a recent history of steatorrhœa and tetany. The serum-calcium was initially 6·6 mg. per 100 ml. She had the signs of idiopathic steatorrhœa (clubbed fingers, anæmia, tetany, abnormal small-gut pattern, and flat glucose-tolerance curve), but she had a gross deficiency of pancreatic enzymes and persistently raised serum-phosphorus (4·1–6·7 mg. per 100 ml.). The high serum-phosphorus was combined with a low urine phosphorus output, but normal renal glomerular function. Later tests proved that there was a greatly increased tubular reabsorption of phosphorus, characteristic of hypoparathyroidism. There was no response to an active parathyroid extract (Ellsworth-Howard test), though there were none of the physical stigmata of pseudohypoparathyroidism. Later, amenorrhœa (associated with a low urinary excretion of follicle-stimulating hormone) and uterine atrophy developed.

The association of steatorrhœa with the features of hypoparathyroidism is surely too common to be fortuitous. Since either alone can produce tetany with low serum-calcium, the combination might easily be missed if not specifically investigated, and hence may well be more common than appears. Nevertheless, the cases reported do not produce a uniform picture. In some the steatorrhœa is the outstanding condition, with biochemical features of hypoparathyroidism discovered accidentally; in others the hypoparathyroidism is outstanding, with the steatorrhœa apparently of less importance. Furthermore, the type of hypoparathyroidism differs in its response to parathyroid extract, though in no case are the characteristic skeletal defects of typical pseudohypoparathyroidism reported. Lowe et al.[5] suggest that in their case the low serum-calcium level led to continued excessive parathyroid hormone production. This caused constant stimulation of the renal tubules till these eventually became refractory. They adduce no evidence for this hypothesis, which could not account for the hypoparathyroidism in cases with a good response to parathyroid extract.

Salvesen and Böe [8] suggest that intestinal moniliasis accounted for the steatorrhœa in their patient. Certainly this could not apply to most of the others. Analysing 85 cases of "sprue" (i.e., presumably idiopathic steatorrhœa),[7] they found that the majority had a serum-phosphorus within the normal range. In 22 cases the phosphorus was low, and all these had bony decalcification; in only one was the serum-phosphorus abnormally raised (a very different incidence from Bennett's 5 out of 15). They suggest that the serum-phosphorus would be expected to be low in all cases, if the parathyroids were responding properly to the lowered serum-calcium. Consequently they believe that most patients with steatorrhœa have a relative parathyroid insufficiency, and they suggest that this is due to the malabsorption of some substance necessary for the normal maintenance of good parathyroid activity. Unfortunately they produce no evidence for the existence of such a substance. As mentioned above, other endocrine secretions have failed in this syndrome—pituitary gonadotrophin in one case, and those of the suprarenal cortex in another. Addison's disease and true hypoparathyroidism are occasionally seen in the same patient, quite apart from the condition under discussion.

I can think of no good explanation for this association of steatorrhœa with hypoparathyroidism, but believe that it is sufficiently well documented to be considered a definite "syndrome." If all patients with steatorrhœa had their serum-phosphorus estimated, and all patients with hypoparathyroidism had their fat absorption estimated, we might learn more about this "new syndrome."

I should like to thank Prof. J. F. Brock, Prof. F. Forman, Prof. G. C. Linder, Dr. R. Hoffenberg, and Dr. E. Dowdle for their interest and help, and Prof. C. E. Dent for drawing to my attention the case of Salvesen and Böe.

Endocrine Clinic,
Groot Schuur Hospital and
University of Cape Town,
South Africa.

W. P. U. JACKSON.

9. Case records of the Massachusetts General Hospital (case 40361), *New Engl. J. Med.* 1954, **251**, 442.
10. MacGregor, M. E., Whitehead, T. P. *Arch. Dis. Childh.* 1954, **29**, 398.
11. Jackson, W. P. U., Hoffenberg, R., Linder, G. C., Irwin, L. *J. clin. Endocrin.* 1956, **16**, 1043.

SENIOR REGISTRARS AND CONSULTANT APPOINTMENTS

SIR,—Dr. Hubble's letter of May 11 is specially valuable in that it throws the limelight on the basic problem of the senior registrars. For years it has been one of the objects of the Registrars' Group to show that the ratio between senior registrars and consultants is too high and that this improper ratio has been worked out on a supposed need for competition. This has always meant that the numbers in training should be fixed above the estimated needs; no serious thought has been given to the fact that this means delay beyond bearing for many whose abilities match up to the available posts but who seem to exist at the present time only to provide "committee fodder." It would be completely rational to allow only just as many senior-registrar posts (in each specialty) as would fill the expected consultant vacancies—based on the assumption that the average senior registrar held his post for the expected four-year period. Take then a specialty, and imagine that twelve posts are to be advertised in 1957. If in fact there were just twelve fourth-year senior registrars available and if all the appointments were made by one committee on the same day, then truly the last post would be filled by default. This sort of situation seems to be envisaged by those who demand competition and wastage. In fact no such thing happens; the twelve posts are advertised at intervals throughout the year and by the time the last appointment is made in December, there is a new crop of well-qualified men ready to compete on level terms with the last of the original twelve; there may even be some second or third year senior registrars to swell the short list; there may be some in their fifth and sixth years and there may be some university lecturers who have never featured on the senior-registrar establishment.

There is nothing fixed about an absolute length of training for any individual in any specialty, and there will always be adequate competition to allow a selection committee to exclude anyone who despite the passage of proper time interval does not match up to the job. There is now and always has been a clear case for a simple adjustment of the ratio between senior registrars and consultants and the creation of a few more consultant posts at the expense of some senior-registrar posts which could then disappear. In terms of finance and in terms of specialist work this could almost be a paper transaction within the service, but it would be a move which would bring sanity into the situation and reassurance into the lives of many senior registrars and their families. It is not enough, however, that the Minister of Health and his advisers should understand this viewpoint; the drive to appoint more consultants and to adjust the ratio must come through the established consultants who, like Dr. Hubble, see the need for extra appointments and are prepared to push what may sometimes

be unpopular opinions in this matter. If this demand does not come the Ministry will for some time remain unconvinced of the position.

I must agree with Dr. Hubble, that senior-registrar appointments at non-teaching hospitals do not promote professional progress, but only when these appointments are *wholly* at non-teaching hospitals. Nothing should be allowed to interfere with the senior-registrar posts where experience is gained both at teaching and non-teaching hospitals during the normal four-year tenure.

Finally, I agree that "assistant consultant" status should not be contemplated as a compromise. There is no real place for such a post in the National Health Service, and although one can understand the plight and urgency of some of its advocates its effect on their own future and on that of the hospital service as a whole might be disastrous.

It would not take much in the way of agreement between the Joint Consultants Committee and the Ministry to set the whole matter to rights with fairness and speed, without prejudice to any other negotiations on pay, conditions of service, or junior hospital staff. Those of us whose influence is limited to writing to the journals will wish luck to Dr. Hubble and his like as they continue to plug away at committees and colleagues.

Royal Albert Edward Infirmary and Dispensary, Wigan. R. M. FORRESTER.

CHRONIC BRONCHITIS AND SMOKING

SIR,—Dr. Harley Williams (May 18) does not like the methods adopted by Dr. Lennox Johnston in his efforts to stop people smoking—perhaps Dr. Johnston's psychopathology exercise is of little value. Personally, I do not like this approach either, but I do raise my hat to his tenacity and enthusiasm.

Of all people who should discourage young people from smoking and encourage smokers to smoke less, surely Dr. Williams should be a pioneer—can he tell us what he has done and what he hopes to do in this connection? May I suggest that he would contribute something really worth while if he persuaded many of the consultant chest physicians to set a good example: how can these men who see the results of smoking ignore the warnings so blatantly?

That Mr. Dunhill (May 18) is amused at the efforts of those who are trying to discourage smoking is understandable: but one of these days the Minister of Health and his department may be forced to take action to protect the public from the ill effects of smoking. And Mr. Dunhill may be less amused when the full effects are felt of a campaign which is now being worked out.

Many of us are not concerned with the axe the cigarette manufacturers have to grind; our only concern is the health and welfare of the millions of people who are ruining their health by the pernicious habit of smoking.

T. W. HURST
Standish, Wigan. Hon. Treasurer, National Society of Non-Smokers.

SIR,—Your three correspondents, Dr. Harley Williams, Dr. Lennox Johnston, and Mr. A. H. Dunhill, whose letters appeared last week, illustrate the variability of the assessment of the enjoyment of smoking.

Mr. Dunhill quotes the plain statement that smoking is enjoyable, Dr. Harley Williams qualifies this by saying that *to smokers* smoking is a pleasure. Dr. Lennox Johnston says that his own assessment of the enjoyment of smoking is negative. So is mine, and one of the deplorable factors in smoking is that so many smokers overlook the fact that smoking is repugnant to most non-smokers. It inhibits their attendance, not only at cinemas and theatres where smoking is allowed, but also at more important places, such as scientific meetings, and makes even ordinary social relationships rather trying. How far the non-smoker suffers medically from the smoker's smoking yet remains to be assessed, but it certainly does not contribute to the non-smoker's joy of living.

Mental Hospitals' Group Laboratory, West Park Hospital, Epsom, Surrey. W. W. KAY.

THE Rh BLOOD-GROUPS

SIR,—To answer the letter of Dr. Renton and Dr. Hancock (April 27) certain little-known facts must first be discussed.

Early in our studies on the blocking-test [1] we found that highly agglutinable erythrocytes are hard to block, while less agglutinable cells are more easily blocked. Accordingly, if the Rh-positive cells used as test-cells for titrating sera are old, lower titres will be obtained in the agglutination test but higher titres in the blocking test. Conversely, more agglutinable erythrocytes, such as fresh cells of type Rh_o^z, or other fresh cells homozygous for the **Rh_0** factor (such as cells of types Rh_1Rh_1, Rh_2Rh_2, and Rh_1Rh_2) give higher titres in the agglutination-test, but give lower titres in the blocking-test because such cells are difficult to block.

Lack of familiarity with this principle has been responsible for serious errors in medicolegal and anthropological blood-grouping work, because the sera available commercially for testing for blood factors **rh′** and **rh″** are mostly prepared from anti-**Rh'_0** and anti-**Rh''_0** sera, to which anti-**Rh_0** blocker has been added. With very agglutinable cells the blocking effect may fail; weak false-positive reactions can result and may be misinterpreted.

Thus in a recent medicolegal case involving Negroids, an expert appointed by the court reported an exclusion involving the factor **rh′**. In repeat tests, his report could not be confirmed, since the mother, child, and putative father all proved to belong to type Rh_0. Presumably the two parents were both of genotype R^0r, while the child was of genotype R^0R^0, and failure of complete blocking of the child's cells gave rise to false-positive reactions with the anti-**rh′** serum, which had been prepared in the usual way by blocking anti-**Rh'_0** serum. In another similar case the putative father was type Rh_2 and the mother type Rh_0, but the child's blood gave weak reactions with the anti-**rh′** serum used for the test. This was obviously a false-positive reaction since control **rh′**-positive cells gave much stronger and clearer reactions with the same serum, and repeat tests with antiserum to which additional blocker was added proved that the baby's type was Rh_0 instead of type Rh_1, as the preliminary tests seemed to indicate. Of course, this pitfall can be avoided by the use of pure anti-**rh′** sera obtained from type Rh_2 individuals, and of pure anti-**rh″** sera obtained from type Rh_1 individuals, but such monovalent sera are available only in limited amounts.

Another striking example of mistakes resulting from this pitfall is provided by a study of blood-type distribution among western Apache,[2] where the following distribution is reported:

Rh-Hr types	*Number*
CDe/CDe	16
cDE/cDE	4
CDE/CDE	2
CDe/cDE	130
CDe/CDE	47
cDE/CDE	16
CDe/cDe	7
cDE/cDe	6
Cde/cdE	2
CdE/cde	0
Cde/cde	1
Total	231

If these results were accepted literally, one would have to conclude that more than 25% of the individuals of this population were carrying the rare gene R^z. Now, it is known that in Mongoloids and American Indians the most common gene by far is R^1; gene R^2 is also present, and though the highest prevalence in the world of gene R^z is among Mongoloids, this prevalence rarely exceeds 5%. Gene r is virtually absent, and almost all individuals of types Rh_1 and Rh_2 are of genotype R^1R^1 and R^2R^2, respectively. Thus,

1. Wiener, A. S. *Proc. Soc. exp. Biol., N.Y.* 1944, **56**, 173.
2. Kraus, B. S., White, C. B. *Amer. Anthrop.* 1956, **58**, 1017.

the use of poorly blocked anti-**rh′** and anti-**rh″** sera could cause a high percentage of these bloods to be misclassified as type Rh_2Rh_1 or Rh_2Rh_2, respectively. I pointed this out in a letter to Dr. B. S. Kraus; in his reply, he admitted the possibility of these errors in the tests, which were carried out in the field under unfavourable conditions.

With respect to the questions raised by Dr. Renton and Dr. Hancock, our experience has been different from theirs. The prevalence of so-called strong D has been much higher than only 5 in 653. If we consider only the rare type Rh_2Rh_2 individuals alone, who (as Dr. Renton and Dr. Hancock admit) almost invariably give strong-D reactions, this would already make up 2% for the minimum prevalence of this strong D. The discrepancy in our experience might be explained if the bloods tested by Dr. Renton and Dr. Hancock were not all perfectly fresh. After only one or two days' ageing, the blood-cells become less agglutinable so that the strong-D effect could readily be overlooked. As I pointed out in a personal letter to Dr. Renton, all his pedigree data can readily be explained on the basis of a gene-dosage effect. For example, the individuals whom he classifies as CDE/cde and cDE/cde seem to be actually of genotypes CDe/cDe and cDE/cDe respectively. Measuring agglutinability, like titrations, is a crude procedure, so variations in the titre may occur due solely to limitations of the technique, and this could account for occasional discrepancies in titration scores. I should like to emphasise that while the possibility of "strong-D" cells such as type Rh^x (–D–) or carriers of gene R^{es} is not denied, the evidence offered by Dr. Renton and Dr. Hancock was inconclusive, and the fallacious use of genotype symbols to represent phenotypes caused these workers to overlook other possible explanations for their observations.

The designations anti-Rh_1 and anti-Rh_2 to which Dr. Nicholas (May 4) objects, have not been used for over a decade, so that they can hardly be a source of confusion. I am glad, however, that Dr. Nicholas has called attention to my book published in 1943, which contains those obsolete symbols, because it also contains the first statistical data refuting the theory of linked genes, which was taken up again two years later by Fisher and Race. (Incidentally, publications fifteen years old are not alone in containing ambiguities where C-D-E is concerned; *every* current article by C-D-E workers contains errors and contradictions, which increase in number as time goes on.)

The justification for the designation "International Rh-Hr Nomenclature" is that these symbols are used by *all* workers, including Fisher and Race, though the latter use the symbols under the transparent pseudonym of "shorthand" symbols.

Dr. Nicholas's response to my eight questions are not forthright answers. It is impossible to acertain, for example, what is his exact position regarding the question of which of the 25 C-D-E equivalents for Rh_1rh is the approved one, or what is the position of Fisher and Race regarding linked genes *v.* multiple alleles, deletions, &c. The difficulty is increased because what the C-D-E paradoxers say often does not correspond with what they do. In fact, their arguments and position shift as rapidly as a chameleon changes his colour. I wonder, therefore, whether Fisher and Race endorse Dr. Nicholas's response, or how would they answer my eight questions?

I should like to call attention once more to the tentative report of the committee on medicolegal problems of the American Medical Association, recommending that in medicolegal reports the correct Rh-Hr nomenclature be used exclusively, and the C-D-E notations be avoided. This report has now been revised, and the final report will shortly be published in the *Journal of the American Medical Association*. When preparing this revised report, the committee took into account correspondence received from approximately 50 workers in the field, and could find no valid scientific reason to change the original recommendation. This report will reach all practising physicians who depend on the *Journal of the American Medical Association* for an expression of approved standards in medical practice.

Brooklyn, New York, U.S.A. A. S. WIENER.

WILSON'S DISEASE

SIR,—May we comment on your leading article (May 11)? We think your statement that "there can now be no doubt that disordered copper metabolism is the underlying cause" of the disease needs amplification. May it not be that the real underlying cause is some inherent biochemical abnormality permitting this disordered copper metabolism to develop? The disease is known to be genetically determined, and it is believed that genes are responsible, not for unit characters, but for unit biochemical processes (Haldane). It would seem justifiable therefore to suggest that hepatolenticular degeneration may be due to faulty genetic control of certain specific protein molecule(s) that normally enter into strong combination with copper, forming cæruloplasmin—the deficiency of which is such a striking feature of this disease. The restoration and maintenance, therefore, of normal tissue-levels of cæruloplasmin by parenteral administration of this enzyme seems an obvious goal once a supply adequate for prolonged treatment is available. A start in replacement therapy of this kind has already been made by Bickel, though a longer period of treatment is necessary before the response can be evaluated. The question arises of the disposition and disposal of the intrinsically administered copper, in addition to the problem of removing copper already accumulated, though it is conceivable that, with a sustained normal blood-level of cæruloplasmin, the disordered copper metabolism might readjust itself spontaneously. Indeed, balance studies in three of our untreated patients showed an exact equilibrium and not a strongly positive balance, which may argue for a phased activity in this respect.

A low serum-copper level is not pathognomonic of Wilson's disease, for it may be found in the newborn and in some patients with the nephrotic syndrome. Perhaps more significant is our recent finding of subnormal levels in some of the parents of our patients as well as in an unaffected sib; one father had serum-copper and cæruloplasmin levels strictly comparable with those of his daughter who died of the disease. It cannot be ignored, then, that some additional factor(s) must co-exist which tip the scale, turning a "potential" into an "actual" sufferer from the disease. A thorough investigation of parents and families of patients may bring to light some new evidence to account for the anomalous situation now apparent. When we can find out what mechanism prevents some individuals with low cæruloplasmin levels from becoming subject to the disease, then perhaps we may be a little nearer helping those not so protected.

Considering therapeutic measures, you infer that the earliest possible treatment with dimercaprol (BAL) of biochemically proven cases is likeliest to succeed. But, working in collaboration with Bickel (details in the press), we have seen the disease in a young girl progress during three years from the onset of symptoms to death, and at necropsy high tissue-levels of copper were found despite protracted regular monthly treatment with dimercaprol, later interspersed with sodium calciumedetate ('Versene'). No clinically satisfying improvement was seen in any of the patients we treated with various copper-removing agents, but it may be that the therapeutic attempts were not vigorous enough nor

of sufficient duration, though seemingly successful in mobilising copper. We found, as did A. G. Bearn (personal communication), that sodium calciumedetate could safely be given intramuscularly with excellent response, and in some patients the oral route was also effective.

We are indebted to Dr. P. G. H. Gell for the determination of cæruloplasmin.

Queen Elizabeth Hospital, Birmingham. GILBERT HALL
F. C. NEALE.

CARBUTAMIDE IN JUVENILE DIABETES

SIR,—Dr. Engleson and Dr. Lehmann [1] found carbutamide (BZ55) safe and useful in children, though Bertram et al.[2] observed hypoglycæmic shock when it had been used for a long time.

We have tested the drug in 16 patients between 6 and 13 years of age. Their daily insulin need before the test period was between 12 and 64 units. Carbohydrate metabolism was estimated from blood-sugar curves determined before and after every meal, and at 12 midnight and 3 A.M.

To 3 children with recent diabetes, who had no tendency to acidosis and who had never received insulin, carbutamide was given for eight days in high doses—2·5 g. (5 tablets) on the first day, and 1·5 or 1·0 g. on each following day. No beneficial effect on carbohydrate metabolism was noted.

6 patients in full equilibrium with insulin were given, instead of the morning dose of insulin, 1–2 g. of carbutamide. Their diet remained unchanged. The effect was related to the state of the carbohydrate metabolism observed during the insulin therapy.

In 2 cases ketosis developed when insulin was stopped, and we were obliged to introduce insulin again. In the 4 other patients there was no ketosis, but the drug did not reduce the blood-sugar; on the contrary, increases up to 500–800 mg. per 100 ml. appeared—levels which had never been observed on insulin.

In 5 cases we gave 1–1·5 g. of carbutamide for five to eight days, combined with a moderate reduction of the dose of insulin. Generally, the evening dose was reduced by 4 units to prevent hypoglycæmia at night.

In 3 cases ketosis arose between the third and fifth days. In 2 cases ketosis did not occur; but a favourable change could not be observed either, and on further reduction of the insulin dose the state became worse.

In 4 cases the drug was given together with unchanged doses of insulin. (In 2 patients, when the combined therapy had had no effect, the dose of insulin was raised to its original level.) In 2 patients the dose was 1·5 g. daily, while to the other 2 patients, together with the full dose of insulin, the dose of carbutamide given on successive days was 2·5, 2, 1·5, 1, 0·5, 0·5, 0·5, 0·5 (i.e., 9 g. in eight days). The drug had no effect on the variations of the blood-sugar curve. It did not influence carbohydrate metabolism, even in patients who received the drug together with the full dose of insulin.

In the course of our experiments it was observed in some cases that in the morning the blood-sugar was much under 200 mg. per 100 ml., but during the day and at night it was extremely high. The beneficial results reported by some observers might be ascribed to their determining only the fasting blood-sugar—i.e., in the morning. In several of our cases this was considerably reduced. Sometimes only traces of sugar were found in the urine but at the same time diuresis was greatly increased, which means that the diabetic state remained unchanged.

In our diabetic children the blood-sugar level was not reduced by carbutamide, even in full adult doses, and a combination of carbutamide and insulin did not give good results.

First Department of Pædiatrics, Budapest University Medical School. L. BARTA.

1. Engleson, G., Lehmann, O. *Lancet*, 1956, ii, 786.
2. Bertram, F., Bendfeldt, E., Otto, H. *Disch. med. Wschr*, 1955, 80, 1455.

FIBROSITIC PAIN

SIR,—The concept that fibrositic pain can be caused by localised areas of muscle in spasm—the so-called myalgic spots or trigger-spots—now seems to be conceded,[1 2] So too do the contentions that these areas can cause referred pain at a distance and that relieving their state of spasm can relieve such pain.

I wish to record a clinical finding which may be of value to general practitioners. During 15 years of concentration on the treatment of myalgic spots in the chronic rheumatic diseases, my case-records have shown that the great majority of these spots responsible for fibrositic pain—more than 90% of them—are concentrated in a few well-defined areas of the body. When this is recognised it becomes much easier to locate the offending spots in cases where the source of the pain is not easily apparent.

For convenience I have called these areas the "critical zones." There are four of them on each side in the shoulder girdle and two on each side in the buttocks.

Critical Zones of the Shoulder Girdle

Zone 1 is the area above the spine of the scapula. In my experience myalgic spots in that situation are often responsible for stiff neck, capsulitis of the shoulder-joint, tennis elbow, and pain or stiffness in the wrists and fingers.

Zone 2 is the area over the shoulder-blade below the scapular spine. Myalgic spots there can cause severe neuralgic pain affecting the wrists and fingers.

Zone 3 is the area along the outer side of the shoulder-blade and extending upwards. There is commonly a myalgic spot in the upper extremity of the teres muscle, always present in long-standing cases of capsulitis.

Zone 4 is between the vertebral column and the mesial border of the scapula. Though small in extent it may contain myalgic spots responsible for local pain, pain referred to the front of the shoulder-joint, spasm of the chest muscles, deficient backward movement of the head, and pain, stiffness, and swelling of the fingers.

Zones 2 and 3 are the areas in which myalgic spots can be responsible for Raynaud's phenomenon.

Critical Zones of the Buttocks

A line drawn from the great tuberosity of the femur to the sacrum divides the buttock into two main zones.

In the upper area, and in its outer portion will be found the spots responsible for pain in the upper part of the thigh, in the sacro-iliac joint, and in the ankle-joint.

In the lower half of this zone may be found the spots causing intense neuralgic pain down the outer side of the thigh in long-standing cases of arthritis of the hip-joint. Commonly they are situated over the tuberosity of the femur.

Near the ischial tuberosity there is often a spot responsible for pain or stiffness in the knee-joint.

Myalgic spots responsible for pain or cramp in the calf muscles and for sciatic pain are often found in the midline of the buttock.

London, W.1. LOUIS MOSS.

1. *Brit. med. J.* 1955, i, 277.
2. Savage, O. How to Live with your Rheumatism. London, 1956; pp. 46, 47.

NORMALITY OF AGEING

SIR,—Apropos Dr. Rudd's article of May 4, I commend to your readers the following passage from Castiglione's *Il Cortegiano*, translated by Sir Thomas Hoby as *The Courtier*. (Mine is the 1937 edition).

"Old men . . . commend the times past, and blame the times present, dispraysinge our doings and maners, and whatsoever they did not in their youth. . . .

"The cause therefore of this false opinion in olde men, I believe (in mine opinion) is, for that, yeares weaning away, carry also with them many commodities, and among other take away from the bloud a great part of the lively spirites that altereth the complexion, and the instruments waxe feebly, whereby the soule maketh her effects.

"Therefore the meek flowers of delyte vade away in that season out of our harts, as the leaves fall from the trees after the harvest, and in steade of open and cleane thoughts, there

entreth cloudie and troublous heavinesse accompanied with a thousand heart griefes: so that not only the bloud but the minde is also feeble: neither of the former pleasures receiveth it anything els but a fast memorie, and the print of the beloved time of tender age, which when wee have upon us, the heaven, the earth and such thing to our seeming rejoyceth and laugheth alwaies about our eyes and in thought (as in a savorie and pleasant garden) flourisheth the sweete spring time of mirth, so that peradventure it were not unprofitable, when now in the colde season, the sunne of our life (taking away from us our delites) beginneth to draw towarde the West, to close in in like case therewithall the mindfulness of them, and to finde out (as Themistocles saith) an arte to teach us to forget: for the senses of our bodies are so deceivable, that they beguile many times also judgement of the minde.

"Therefore (me thinke) olde men be like unto them, that sayling in a vessel out of an haven, beholde the ground with their eyes, and the vessel to their seeming standeth still and the shore goeth: and yet is it cleane contrarie, for the haven, and likewise the time and pleasures continue still in their estate, and we with the vessel of mortalitie fleeing away, go one after another through the tempestuous sea, that swalloweth up and devoureth all thinges, neither is it granted us at any time to come on shore againe, but alwaies beaten with contraire windes, at the end wee breake our vessel at some rocke."

London Hospital
Medical College, E.1. ALAN M. BRAVERMAN.

ATHEROSCLEROSIS IN THE BANTU

SIR,—In his letter of April 13, Dr. Annand stated that the Bantu of South Africa are relatively free from atherosclerosis. That this belief is fairly general is suggested by an editorial in the *South African Medical Journal*.[1]

Such a view conflicts with the few satisfactory post-mortem records that do exist. Possibly the most satisfactory of such records are those of Becker,[2] who stated that "the incidence of atheromatosis in the ascending period of life in the Bantu and Coloured subjects (of South Africa) is not far removed from that in other races; the incidence of the senescent type may be slightly less." Our findings are similar to those of Becker and we propose shortly to publish our records.

It seems wrong, therefore, to claim that the relative freedom of the South African Bantu from coronary-artery thrombosis is attributable to a relative freedom from atherosclerosis. We feel that one likely explanation for this relative freedom may be found in the changed physical and chemical characteristics of the Bantu blood, which in turn may be linked with some abnormality of liver function.

Department of Medicine,
Department of Pathology,
Edendale Hospital,
Pietermaritzburg, Natal. J. D. WOODS.
W. LAURIE.

PRIMARY HEPATIC CARCINOMA

SIR,—In your annotation of April 6 you claim that the incidence of primary carcinoma of the liver, judged by necropsy findings, has increased distinctly in recent years. In support of this statement figures from the Mayo Clinic are quoted—to wit, in 1926 the frequency was 0·083% of 5976 necropsies, contrasted with the finding in 1947 of 0·19% of 16,303 necropsies.

Applying the χ^2 test to the incidence-rates and the number of necropsies it can be shown that the absence of a real difference between the given rates of 1926 and 1947 has a probability of more than 7%. In addition, the true incidence of a disease cannot be properly represented by necropsy material. Therefore, it appears that the quoted figures do not justify the conclusion that the incidence of primary carcinoma of the liver has increased.

Veterans Administration Hospital,
Swannanoa, N.C., U.S.A. OSCAR KANNER.

1. *S. Afr. med. J.* 1957, **21**, 352.
2. Becker, B. J. P. *S. Afr. J. med. Sci.* 1946, **11**, 97.

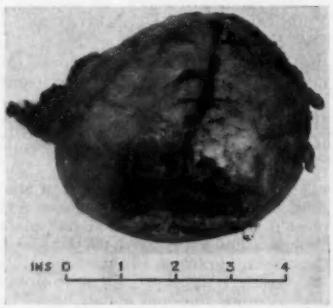
RUPTURE OF THE PREGNANT UTERUS

SIR,—Mr. Higgins (March 23) has called attention to rupture of the pregnant uterus resulting from previous curettage, a condition which is probably more common than would appear from the literature. Curettage is commonly done by junior residents—often people holding their first gynæcological appointment—and it is important that this hazard be more widely recognised.

I should like, for this reason, to report the following two cases:

CASE 1.—A pregnant woman aged 37 had had seven full-term pregnancies with easy, spontaneous deliveries, and five miscarriages, the last in July, 1951. This miscarriage was apparently accompanied by considerable bleeding even after evacuation, and she was taken back to the operating-theatre, where an adherent piece of placenta was removed from the fundus with ovum forceps, with considerable difficulty.

Four months later she became pregnant again, had an uneventful antenatal period, and was admitted at term in very early labour. The history of the difficult evacuation was unknown at that time. On examining this patient during a night round (done merely as some insurance against being called after returning home from an emergency, and not because any abnormality had been reported) I found a soft cystic swelling at the fundus of the uterus, judged to be the size of half a tennis-ball, though the major part of the swelling seemed to be behind the xiphisternum. The swelling was neither painful nor tender. During a uterine contraction the swelling remained soft, but appeared to bulge slightly. Uterine rupture was diagnosed. Although the notes of the previous curettage were not at that time available, it was considered to be a likely ætiological factor.



Uterus in case 1, showing large rupture at fundus. Stitched incision is site of cæsarean section.

The patient was in excellent condition and an immediate laparotomy was performed. The placenta was being extruded through a hole, three inches in diameter, in the fundus of the uterus (see figure). There was a small amount of clot around the hole, but no free blood in the peritoneal cavity. Satisfactory repair was unlikely, so a cæsarean section followed by hysterectomy was done. The baby weighed 8 lb. 6 oz. and was vigorous from birth, and the mother had an uneventful puerperium.

CASE 2.—A woman aged 37, para. 3, had a normal home confinement at term in March, 1951. She was admitted to hospital two weeks later with a severe secondary postpartum hæmorrhage. She looked exsanguinated and very shocked. A blood-transfusion was given and the uterus evacuated. During the evacuation the curette was felt to pass through the fundus, and I was asked to see her. Exploration of the uterus revealed a hole that would admit one finger. At laparotomy there was a moderate amount of free blood in the abdomen and a small hole in the fundus of the uterus, the edges of which were bleeding. There was no damage to other organs. The hole was repaired with figure-of-eight sutures and the patient recovered uneventfully.

She became pregnant again eighteen months later. The antenatal course was uneventful until term, when she complained of considerable pain and tenderness in the fundus of the uterus at the site of the previous rupture. There were no clinical signs of rupture other than the tenderness, but, as she was in considerable pain and very apprehensive, imminent rupture was suspected and a laparotomy was performed.

The surface of the fundus was intact. A lower-segment cæsarean section was done. A small area of the placenta was adherent over the site of the scar, which was slightly thinner than the rest of the fundus, but there was no evidence of impending rupture, of retroplacental hæmorrhage, or of

anything else to account for her symptoms. The baby was vigorous and the mother had an uneventful convalescence.

The first patient, who had a large rupture, and who had not been given warning of the importance of hospital confinement following damage at curettage, was completely without symptoms. Had the swelling on the fundus not been fortuitously discovered, there would have been a catastrophe. In case 2 the uterus was intact, yet the patient had symptoms and a previous history which indicated laparotomy.

From these cases, and the few others that have been published, it can be seen that many more cases will have to be recorded before we can assess the dangers of uterine damage resulting from curettage or draw the picture of impending and early rupture in pregnancies after such damage.

Dudley Road Hospital,
Birmingham. EDWARD COPE.

ANÆSTHESIA FOR FRACTURES OF THE FEMORAL NECK

SIR,—Referring to an article on Fractures of the Femoral Neck by Dr. Murray and Mr. Young (March 23), Dr. Rollason (May 4) writes: "In my experience it is unnecessary to raise the blood-pressure preoperatively or during operation in those patients who have had chlorpromazine as part of their premedication." I am sure that Dr. Rollason is absolutely right, but in my experience it is unnecessary to complicate the anæsthetic by the addition of chlorpromazine.

I had a "run" of fractures of the neck of femur between Feb. 25 and March 6, all in women: (1) aged 87, Capener nail-plate; (2) aged 86, McKee nail-plate; (3) aged 78, Smith-Petersen nail; (4) aged 69, McKee nail-plate; (5) aged 91, Capener nail-plate; (6) aged 85, McKee nail-plate; (7) aged 86, McKee nail-plate. All were premedicated with morphine and atropine one and a half hours before operation and two ampoules of 'Adrenoxyl' (1·5 mg.) half an hour later.

Anæsthesia was induced by a sleep dose of hexobarbitone and 60 mg. suxamethonium bromide, and was maintained on nitrous oxide 8 litres and oxygen 2 litres per minute endotracheally, further suxamethonium bromide being given if the patient showed any signs of reflex movement.

None of these patients had any infusions or transfusions; all recovered and are alive and well except no. 4, who fell forwards over her knitting on the fourth day and died of a coronary thrombosis; they were all able to take nourishment by mouth on the day of operation, and read their newspapers the next day. The blood-loss during operation was minimal owing to the adrenoxyl, which reduces the bleeding-time and increases the capillary resistance, and by conserving the patient's blood abolishes the need for transfusions.

This appears to me to be the ideal anæsthetic for major cases, and the addition of further drugs tends only to complicate the issue. Incidentally if the adrenoxyl is not given in good time it can be given immediately before operation mixed with hyaluronidase.

Amersham, Bucks. J. SHEGOG RUDDELL.

RELATIVES IN HOSPITAL

SIR,—I was delighted to read your excellent article of May 11, which deals with an aspect of hospital medical work to which indeed scant attention is being paid.

I think it can be claimed that a not unsuccessful attempt to deal with the many aspects of the problem has been made in the pædiatric sphere. It is in relation to the adult patient that our failure is so grossly evident. I think that you make one mistake and also that you omit to make one vital point.

Firstly the mistake. The wisdom and humanity needed to deal with the various anxieties and sorrows resulting from illness are not to be taught to young men at a university. To attempt to do so could only encourage their seniors to continue the common and highly criticisable habit of deputing such duties to them.

The omission. If we are honest we will admit that for relatives in trouble there is only one man—that is, the doctor in charge of the patient, usually a consultant. Any junior doctor at all is only second-best. Apparently, and in general, the modern hospital consultant does not think that care for relatives is part of his obligation—either to superintend or organise such care, or to take part in giving it himself in outstanding cases. I think it is also very probable that regional hospital boards would hesitate before providing time for them to do such work. I think, therefore, that you omit to point out the serious ethical lapse which we have allowed to grow, in treating a vital part of our obligation as an unimportant matter to be left to juniors.

Until this is remedied—that is, until it is acknowledged much more generally that the care of patients' relatives is work of the highest importance requiring all the skill and experience and more, of which the best of us is capable—we may expect the press to carry complaining letters from perfectly decent people who feel that they are not being properly treated.

Leasowe Children's Hospital,
Moreton, Cheshire. J. K. CAMERON.

L-NORADRENALINE THERAPY IN ACUTE RENAL FAILURE

SIR,—In his extremely practical article (May 11), Dr. Mattingly has drawn attention to the value of vigorous noradrenaline therapy in hypotensive states complicated by acute renal failure. He rightly emphasises, with the help of a dosage-chart, the need for using high concentrations of the drug, far in excess of those often recommended. Therapeutic failures, when lower concentrations are used, lead to unjustifiable censure of this drug's capacity to restore the normotensive state. The risk of tissue-necrosis at the infusion site (to which Dr. Mattingly also refers) appears to be considerably reduced by the use of local phentolamine as an antidote.[1]

It would be convenient if the manufacturers would provide ampoules containing 16 mg. and 32 mg. of noradrenaline, for use where high concentrations are needed. It would not then be necessary to open eight 4 mg. ampoules and inject their separate contents into a 500 ml. infusion-bottle, each time a fresh one was needed. In a case I reported,[2] 200 ampoules had to be opened.

Finally, in support of Dr. Mattingly's experiences with acute renal failure, may I report 2 similar cases, which bore a striking resemblance to each other in many respects?

Both patients were men, admitted within four days of each other, with a history of recurrent syncopal attacks and precordial pain of recent onset; in both cases the electrocardiogram on admission showed evidence of acute posterior myocardial infarction, with a pulse-rate of about 46 a minute and nodal rhythm; both were shocked, with systolic blood-pressures averaging 80–90 mm. Hg; and in both, severe oliguria and uræmia developed.

The 1st patient was completely anuric for twenty-four hours after admission. Noradrenaline was then started, in conjunction with the régime of Bull et al.[3] His output of urine gradually rose to normal over a period of a week, noradrenaline being needed the whole time to maintain his blood-pressure, though in quantities not exceeding 8 mg. per litre of infusion. His blood-urea reached a maximum of 262 mg. per 100 ml. on the fourth day after admission. The 2nd patient passed only 90 ml. of urine during the second twenty-four period after admission, and a noradrenaline infusion was started and continued for four days (maximum strength 12 mg. per litre). His urinary output reached normal about the fourth day, though his blood-urea continued to rise to 198 mg. per 100 ml. on the fifth day after admission. A further rise to 289 mg. per 100 ml. on the seventh day was thought to be due to melæna, which complicated his anticoagulant therapy. Both patients were eventually discharged with normal renal function.

Llanelly, Carmarthenshire. J. DE SWIET.

1. Zucker, G. *J. Amer. med. Ass.* 1957, **163**, 1477.
2. de Swiet, J. *Brit. med. J.* 1955, ii, 1253.
3. Bull, G. M., Joekes, A. M., Lowe, K. G. *Lancet*, 1949, ii, 229.

CORTISONE AND IMMUNITY IN TUBERCULOSIS

SIR,—In your annotation of May 4 you state "these findings [i.e., from animal experiments] also explain the lack of interference by cortisone with the efficacy of B.C.G. vaccination. In short, cortisone does not seem to impair acquired resistance in guineapigs."

Possibly, a few investigations carried out with another species—namely, the mouse—are of some relevance here. This animal, by contrast with the guineapig, is virtually anergic towards tuberculin. By prior vaccination with viable B.C.G. given intravenously it can nevertheless be protected against a virulent laboratory infection, either by *Mycobacterium tuberculosis* var. *hominis* systemically [1] or *M. tuberculosis* var. *bovis* intracorneally.[2] Using the latter technique, it was found that the subcutaneous administration of cortisone acetate at the rate of 0·5 mg. daily for 28 days, this period beginning with the corneal inoculation, resulted in a complete loss of that protection otherwise to be expected.[3] Indeed, the corneal lesions in the cortisone-treated, vaccinated animals tended to be more severe than in unvaccinated controls.

Mice are naturally endowed with some resistance towards tuberculous infections. The experimental corneal disease, for instance, normally remains confined to the eye. Yet, as Naguib and Robson [4] have shown, the giving of cortisone following inoculation leads to more rapid progress of the ocular lesion and, significantly, to systemic spread of the infection as well.

Now that cortisone is being given much more readily to patients with tuberculous disease we must hope that, as humans, we have more in common with the guineapig in this respect and less with the mouse. Otherwise, it seems, the "best-laid schemes of mice and men" will surely "gang aft a-gley."

London, S.E.1. ROY GOULDING.

CÆSAREAN SECTION

SIR,—I know of a maternity hospital with slightly over 1000 annual admissions, whose cæsarean section incidence in 1955 was 9·5%, nearly equal to the forceps rate, and in 1956 was 11%, slightly in excess of the forceps rate. If similar situations exist in other parts of the country, and a prominent member of the Royal College of Midwives tells me that they do, then your leading article on cæsarean section (April 6) is opportune.

The maternal mortality of 0·99% following cæsarean section reported by Marshall and Cox [5] for the years 1943–47, was more than 18 times as high as the maternal mortality (excluding abortions) for this country in 1955 (0·54 per 1000). It may benefit surgically minded obstetricians to reflect that if they lose only one mother in their first 183 cæsarean sections, their maternal mortality for sections will nevertheless be exactly 10 times higher than the latest published maternal mortality for the country.

Professor Baird (April 27) says it is fortunate that cæsarean section is seldom indicated in young women, because it is prejudicial to further childbearing; but this seems to be a minor consideration with older women because "few primigravidæ over 30 years of age have a second child." In case others share this false belief, I offer the following information. A few years ago in our practice, I questioned 1000 women regarding their pregnancies. 133 did not have a child before the age of 30. Of these 133 mothers, 17 out of 32 who began to have children at thirty, had further offspring. At later ages the figures were as follows:

9 out of 19 who began at thirty-one.
10 out of 18 who began at thirty-two.
9 out of 18 who began at thirty-three.
5 out of 12 who began at thirty-four.
6 out of 13 who began at thirty-five.
3 out of 7 who began at thirty-six.
2 out of 3 who began at thirty-seven.
2 out of 4 who began at thirty-eight.
2 out of 2 who began at thirty-nine.

2 of the women who began at thirty-six years of age had 4 children apiece. Of older women, 2 who began their family at forty, 2 who began at 41, and 1 who began at 43 did not have further offspring. Nevertheless, out of the total of 133 primiparæ who were 30 years or over, 65 or 48·9% did have two or more children.

The forceps incidence in primiparæ rises progressively with age, but the steady deterioration of uterine function, which occurs after 25, according to Professor Baird, is essentially a primiparous condition. As only 7% of secundiparæ who required forceps in their first confinement, require them again,[6] the defect in uterine function is apparently remedied by one vaginal delivery. On the other hand, cæsarean section is likely to maintain this uterine dysfunction, and to ensure the need for a repeat cæsarean section in any mother over thirty, who is courageous enough to risk another pregnancy.

Reading. K. D. SALZMANN.

CLINICAL THERMOMETERS

SIR,—Your correspondents need only look in the late Prof. Samson Wright's *Applied Physiology* to find an explanation of the term "half-minute" on clinical thermometers. In a footnote on p. 468 he states that a half-minute is the standard time taken for the thermometer to reach equilibrium under standard conditions. These not being applicable in the human body a longer period of time is necessary to reach equilibrium and accurately record the body-temperature.

No doubt if the thermometer were placed in blood it would reach the temperature in the requisite half-minute.

London, E.9. T. SUSSMAN.

SURGEON'S "PRIVILEGE"

SIR,—"A cup of tea for the doctor" was traditional long before tea-breaks became one of the greatest hindrances to industrial production in this country. In cottage, council house, and castle a cup of tea was the inevitable termination of any medical rite, a privilege both to offer and receive. May I add a little detail to the general terms of the letters from Mr. Capener (May 4) and Miss Judge (May 11)?

When we first heard that we had to pay, I took with me a flask of tea and a bun on those afternoons when I had long outpatient clinics. Later, when a nominal charge of 1*d.* for a cup of tea was imposed, my wife rebelled at preparing the flask two or three times weekly. I protested that "it was the principle I objected to," but I was told that to pay only 1*d.* for a cup of tea was the best bargain I should ever obtain from the National Health Service, and I had to submit.

I have now a collection of receipts for 2*d.* upwards, including one for 6*d.*, the account for which was sent to me by post and forwarded because I was on holiday. I could not resist paying it by return of post and by postal order.

At last it was realised that the book-keeping was not worth the trouble, and now to satisfy the auditors a token payment of 2*s.* 6*d.* a year is made for all liquid refreshments. This is an even better bargain, but still ridiculous.

Harrogate. T. G. REAH.

1. Dubos, R. J., Pierce, C. H., Schaefer, W. B. *J. exp. Med.* 1953, **97**, 207.
2. Goulding, R. Thesis, University of London, 1956.
3. Goulding, R. *Tubercle* (in the press).
4. Naguib, M., Robson, J. M. *Brit. J. Pharmacol.* 1955, **10**, 387.
5. Marshall, C. M., Cox, L. W. Transactions of the 12th British Congress of Obstetrics and Gynæcology, 1949; p. 30.
6. Salzmann, K. D. *Brit. med. J.* 1955, ii, 17.

PRIVATE PRACTICE GROUP

SIR,—Last summer a number of private practitioners, intent on preserving and extending the institution of private practice, met in London. They decided to make themselves the nucleus of what they hoped would become a substantial group, and deputed to an acting executive the task of encouraging its growth.

All known private practitioners in Great Britain were approached; many responded with enthusiasm and these now form, with the original nucleus, a Private Practice Group.

The Group believes that on the continuance and prosperity of private practice must depend, to a great extent, the well-being of the profession and the quality of medical service rendered to the whole body of citizens, whether through private or public channels. It further believes that, unless those in private practice defend its interests and speak up for it, no-one else will, and doctor and citizen may one day wake to find they have lost by default one of those precious "free institutions"—that of seeking and giving medical advice and help privately, without the participation of the State.

The Group's immediate aims are:

1. To press for the right of private patients to receive drugs on the same terms as patients treated under the National Health Service.
2. To consider again the possibility of "opting out."
3. To press for more, and less costly, private beds.
4. To inquire into and, it is hoped, to promote insurance schemes to cover general medical attention.

These aims are intended to supplement, but in no way to conflict with, those of the profession as a whole.

It is obvious that the Group would not exist unless its members felt that private practice had become something of a Cinderella. It has no wish to be or become a "splinter group," and it is approaching the organisation committee of the B.M.A. with a view to receiving recognition.

Meanwhile, the Group desires to increase its membership from among those who believe and have an interest in private practice, although, as general practitioners or consultants, they work also in the National Health Service.

There is no subscription, but secretarial expenses have so far been met by donations of a half to one guinea by members.

The members of the Acting Executive are: L. W. Batten (acting president); I. J. Brock (acting treasurer); A. E. J. Etheridge (acting secretary), 73, Fitzjohn's Avenue, London, N.W.3; and W. Russell.

London, N.W.3. JOHN ETHERIDGE.

PREVENTION OF BEDSORES IN PATIENTS NURSED AT HOME

SIR,—As the geriatric services develop, skilled home care for the aged becomes increasingly important. Bateman [1] described a new régime for the prevention of bedsores in the elderly bedridden patient in hospital: he concluded that the new method was at least as effective as the old, and that much labour and time was saved. I decided to instruct one district nurse in the new technique, and encourage general practitioners and the nurse to select suitable cases for a controlled trial.

A letter was sent to each practitioner in the selected area, inviting his coöperation. The district nurse was then requested to contact the practitioner, to find out if he agreed to the patient being included in the trial. When he agreed, the procedure was as follows:

A silicone barrier cream was smeared thinly and evenly on all the pressure-points twice daily for a week and then once daily.

The skin was washed with soap and water as infrequently as possible. Once or twice a week, or when they became fouled, the pressure-points were washed with warm water only, and carefully dried.

The patient was urged to change his position in bed at least five times daily.

As additional measures, the family doctor was asked to prescribe ascorbic acid 50 mg. t.d.s. and tolazoline 25 mg. t.d.s. The latter, besides being a cardiac stimulant, dilates peripheral blood-vessels and thus improves the blood-supply of the skin.

23 patients were thus treated. Most were elderly, and many in poor general condition; but the results were very good (in some cases broken skin healed despite poor general condition):

Result	*No.*	*Remarks*
Excellent ..	17	Condition of pressure-points satisfactory throughout trial or improved.
Fair.. ..	2	Condition of skin over pressure-points improved, but bedsores developed later (1 patient would not take ascorbic acid and tolazoline because of vomiting; the other refused them)
Not assessed	4	2 died and 1 admitted to hospital within a few days of starting treatment; 1 refused to coöperate.
Total ..	23	

The number of cases treated with silicone barrier cream in this survey is small and there are no controls; but the results are very satisfactory and it is proposed to introduce this method throughout the county with the coöperation of general practitioners. The treatment not only saves a great deal of unnecessary suffering in bedfast patients but also reduces the time spent on the treatment of pressure-points and obviates the labour of treating patients by the usual method of washing and rubbing with spirit. The three district nurses who have had experience of the new method praise it highly. They also report that elderly patients who are free of bedsores show a quick improvement in their general condition.

Dr. Bateman emphasised that ascorbic acid and tolazoline are an integral part of the treatment. This is supported by 2 cases in our own small survey in which improvement ceased when the patient did not take the tablets.

Our sincere thanks are due to the general practitioners in the Rhyl area for their ready coöperation in this trial, and to the three district nurses for carrying out the trial and recording their findings.

County Health Offices,
Mold, Flintshire.

G. W. ROBERTS
F. M. WILLIAMS.

1. Bateman, F. J. A. *Brit. med. J.* 1956, i, 554.

RELEASE OF HISTAMINE IN URTICARIA PIGMENTOSA

SIR,—I was very interested in Dr. Hamrin's preliminary communication (April 27) and in Dr. Calnan's letter (May 11).

In studying a series of cases of urticaria I have found that, although true allergy to salicylates leading to urticaria occurs, in addition it is not uncommon to find that salicylates will affect the degree of an existing chronic urticaria. This is usually seen when the patient takes acetylsalicylic acid as an analgesic, but in these cases the same effect can be obtained by giving sodium salicylate. The response depends on the dose of salicylate and on the degree of urticaria at the time of administration. Thus in a patient with chronic urticaria acetylsalicylic acid gr. 5 may produce an exacerbation but have no effect at a later stage when the urticaria is in a milder phase. Similarly, a patient showing no response to gr. 5 may get an exacerbation when the dose is increased to gr. 20. As suggested by Dr. Hamrin and Dr. Calnan, it seem possible that salicylate acts in such cases by liberating histamine.

I hope to report further findings later.

Bristol. ROBERT P. WARIN.

Medicine and the Law

A Capital Murder

THE new defence of diminished responsibility under section 2 of the Homicide Act, 1957, was first raised at the trial of Shirley Campbell at Leeds Assizes last month. In that case the defence succeeded, the accused being found not guilty of murder but guilty of manslaughter as required by section 2.[1]

The defence was raised again—this time unsuccessfully—at the trial at Newcastle last week of Ronald Patrick Dunbar, a labourer aged 24, on the charge of the capital murder of an 82-year-old widow and unlicensed moneylender.[2] It appeared from Dunbar's own statements that he had broken into the woman's house, for the second time within a week, to rob her, and that he killed her with blows of a bottle on the head when she woke and, he thought, recognised him.

Called as a witness for the defence, Dr. Robert Orton, a consultant psychiatrist, said that Dunbar was an inadequate psychopath. This view was not accepted by Dr. Ian Pickering, senior medical officer at Durham Prison, who was called by the prosecution. In his opinion, the accused was not a psychopath; he had an intelligence quotient of 112.

In reply to cross-examination, Dr. Pickering said that there were variations in the type of psychopathy, but not in degree. Psychopathy was an abnormality of personality which could be regarded as an abnormality of mind and could impair mental responsibility. Dr. Pickering agreed that, if a man were rightly said to be a psychopath, the only remaining question would be whether the abnormality of the mind would substantially impair his mental responsibility for the act in question.

Dr. Pickering told the judge that he would expect a psychopath to show remorse. This man had not, unless giving himself up to the police was a sign of remorse.

Dealing with the effect of section 2 of the Homicide Act, the judge told the jury that it had not been put into the Act as a soft option. If the case came within section 2, the jury would say so. If it did not, they would not return a verdict within the section merely because the alternative was something somewhat grim.

The jury returned a verdict of guilty of capital murder—the new term for those categories of murder still punishable by death—and Dunbar was sentenced accordingly. The case may serve as a reminder that, if the section is pleaded, the onus of proof is on the defence.

Death after Adder-bite

A boy of 14 collapsed and died a few minutes after he had been given serum as treatment for an adder-bite. At the inquest last week,[3] a pathologist gave the cause of death as cardiorespiratory failure due to anaphylactic shock following snake-bite treatment, and he added that "if the serum were not given at the earliest possible moment, it would have been nothing short of criminal neglect." The coroner, recording a verdict of death by misadventure, said that every step had been taken and it was very unfortunate that the condition arose which caused the boy's death. The evidence indicated that nothing had been left undone which could have avoided the ultimate result. After the boy collapsed oxygen was given and the heart was massaged. After starting to beat again, the heart gradually stopped and further efforts to stimulate it were unsuccessful.

1. See *Lancet*, May 4, 1957, p. 938.
2. *Times*, May 17, 1957.
3. *Ibid*, May 18, 1957.

Obituary

WALTER PERCEVAL YETTS

C.B.E., D.Lit. Lond., M.R.C.S.

Dr. Yetts, who died on May 14, held the chair of Chinese art and archæology in the University of London and he will be remembered chiefly for his work on these subjects. But his work as a doctor should not be forgotten, for he served efficiently for many years in the Royal Navy and at the Ministry of Health.

He was born at Reading in 1878, the son of A. M. Yetts, and was educated at Bradfield College and Lausanne University. He qualified in 1903 from St. Bartholomew's Hospital, and the same year entered the Royal Naval Medical Service. In 1904 he was Admiralty gold medallist for naval hygiene. His visits to Chinese ports aroused his interest in Chinese art, and he learned the Chinese language before he retired from the service in 1912 with the rank of staff surgeon. In 1913 he was appointed acting medical officer to the British legation in Peking, and in the 1914–18 war he served in the R.A.M.C. as temporary major and deputy assistant director of medical services, Embarkation. After a year as deputy commissioner of medical services at the Ministry of Pensions, he was appointed, in 1920, a medical officer of the Ministry of Health, where he worked in the section dealing with sanitary administration in relation to infectious diseases.

In 1927 he resigned from the Ministry to give all his time to teaching, lecturing, and writing on Chinese art. His distinction in this field was recognised by his appointment in 1930 to the newly founded Lectureship on Chinese art and archæology at the School of Oriental Studies in the University of London. Two years later he became professor of Chinese art and archæology. He occupied the chair until 1946, when he retired with the title of professor emeritus. He was the first to make Chinese archæology a subject of academic study with organised courses for postgraduate degrees and diplomas.

As a sinologist Yetts won many distinctions. He was awarded the D.LIT. of London University in 1934; he was a vice-president of the Royal Asiatic Society, chairman of the China Society, corresponding member of the Vereeniging van Vrienden der Aziatische Kunst (The Hague), and honorary correspondent of the National Library of Peiping (Peking). His contributions to the literature of his subject were important. His book on *Chinese Bronzes* was published in 1925, and he was also the author of six volumes in the *Eumorfopoulos Collection Catalogue* and of *Ritual Bronzes of Ancient China* (1938). His books and articles were illustrated by beautiful drawings and reproductions of inscriptions and were notable for their comprehensive bibliographies.

A. S. MacN. writes:

Yetts was a pleasant colleague, somewhat reserved in manner, and with no great liking for the restrictions of a Government office, although he performed his duties conscientiously and well. His knowledge of Chinese was a great asset. He was often consulted on international health work relating to China, and always chosen to escort distinguished Chinese medical visitors in their tours of English hospitals and health centres. But his real interest lay in Chinese art, especially in the bronzes and jade of the prehistoric period. His years of retirement were spent at Chesham Bois, Bucks, where he was always glad to welcome old students, friends, and former colleagues. His chief recreation was painting in water-colours, a taste which he shared with his wife, an accomplished artist.

Professor Yetts married in 1912 Gwendoline Mary, daughter of the late Mr. D. Hughes, F.R.C.S.

HAROLD GUYON TRIMBLE

M.D.

Dr. H. G. Trimble, associate professor of clinical medicine at Stanford University, California, died on May 13 at the age of 60. He had recently been elected to the board of regents of the American College of Chest Physicians and was head of the board of examiners for its fellowship. He was a member of the National Tuberculosis Association and the American Trudeau Society, and he was chairman of the research committee of the Californian Medical Association. He had come to Europe regularly since 1950 and each year had spent some time in this country attending conferences and visiting institutions and clinics for diseases of the chest. In 1954 he was awarded the Varrier Jones gold medal and he gave a lecture in London on a statistical analysis of the present-

day treatment of pulmonary tuberculosis. He addressed the British Tuberculosis Association in Bristol last year on pneumoperitoneum therapy.

Two of his English colleagues, C. W. L. J. and M. M. N., write :

Harold Guyon Trimble enriched the lives of all those with whom he came in contact. His kindly bearing and his readiness to help were well known among his many friends all over the world and in this country in particular. He was only this week to have been elected as honorary life member of the British Tuberculosis Association in addition to his vice-presidency of the South East Metropolitan Tuberculosis Society. The mode of his death—he was shot by a patient near his consulting-room—adds to the tragedy of his passing. His reputation as a physician and as a man of deep knowledge and interest in his subject had spread far from his home country, and his reputation in Europe and in the Far East was one of great scholarship and humanity.

Diary of the Week

MAY 26 TO JUNE 1

Monday, 27th

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Dr. S. Udenfriend (Bethesda, U.S.A.): Clinical Studies Relating to Tryptophan Metabolism.

INSTITUTE OF PSYCHIATRY
5.30 P.M. (Maudsley Hospital, Denmark Hill, S.E.5.) Prof. H. G. K. Westen-Brink (Utrecht): Some Investigations Concerning Vitamin B_1 with special reference to Brain.

MANCHESTER MEDICAL SOCIETY
9 P.M. (Medical School, University of Manchester.) *General Practice.* Dr. H. S. Barber: Management of Arthritis in the Home and in Hospital.

Tuesday, 28th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. F. P. Lee Lander: Rest and Pulmonary Tuberculosis. (Mitchell lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. R. T. Turner-Warwick: Lymphatics of the Breast in Relation to the Spread of Carcinoma and its Treatment. (Hunterian lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Dr. M. C. G. Israëls, Dr. Rosemary Biggs, Prof. J. V. Dacie: Some Blood Disorders.

UNIVERSITY COLLEGE LONDON, Gower Street, W.C.1
5.15 P.M. Prof. P. Balint (Budapest): Nervous Regulation of Renal Function.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Prof. C. A. Keele: Cutaneous Pain and Itch.

ROYAL STATISTICAL SOCIETY
5.30 P.M. (Westminster Medical School, Horseferry Road, S.W.1.) *Medical section.* Dr. J. H. Edwards: Some Aspects of Cigarette Poisoning.

Wednesday, 29th

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Differential Diagnosis of Fungous Infections of the Skin.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. P. D'Arcy Hart: Place of B.C.G. Vaccination in an Established Tuberculosis Service.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5.30 P.M. Prof. G. Schaltenbrand (Würzburg): Myographic Analysis of Spasticity and Rigidity.

Thursday, 30th

ST. MARY'S HOSPITAL MEDICAL SCHOOL
5 P.M. Dr. Udenfriend: Metabolism of Phenylalanine, Tyrosine, and Adrenalin.

GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1
5 P.M. Dr. William Evans: Conditions that Mimic Heart-disease. (Carbutt memorial lecture.)

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. J. Wallace: Skin Diseases of the Vulva.

HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Mr. J. A. C. Fleming: Radiation Injuries in Clinical Practice.

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Prof. Russell Fraser: Diagnostic Procedures in Bone Disease.

Friday, 31st

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and Preventive Medicine.* Prof. C. H. Stuart-Harris, Dr. W. Wood, Dr. J. O.'H. Tobin, Dr. John Knowelden: Poliomyelitis Vaccination in 1956.

ST. MARY'S HOSPITAL MEDICAL SCHOOL
5 P.M. Prof. W. J. Hamilton: The Early Ovum.

GUY'S HOSPITAL MEDICAL SCHOOL
5 P.M. Sir. John Cockcroft, F.R.S.: Atomic Energy and its Biological Implications. (Fison lecture.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
10 A.M. Prof. F. A. R. Stammers: Mechanical Factors in Post-gastrectomy Complications and Syndromes.

MEDICAL RESEARCH SOCIETY
5.30 P.M. (London School of Hygiene, Keppel Street, W.C.1.) Dr. Stanley F. Bradley (Columbia University): Circulatory Adjustments to Postural Changes.

Notes and News

UNIVERSITY APARTHEID

WE have lately discussed the intention of the government of the Union of South Africa to take over the Durban medical school from Natal University.[1] In a second report[2] Prof. I. Gordon, dean of the medical school, sets out subsequent developments.

Although a technical difficulty in the Union Parliament has delayed that part of the Separate University Education Bill which deals with the separation of the Durban medical school from the University of Natal, there is no change in the intentions of the government. The medical school will be dealt with in due course. The Bill as first published provides for the establishment of "Bantu" and "non-White" university colleges, from which the Durban medical school is in no effect distinguished. In these colleges the minister of education will have the right both to limit numbers and to reject candidates for admission. The minister has the power to appoint, promote, transfer, or discharge any member of the staff; this power may be exercised by any deputed officer of his department for posts designated by the minister. In the interests of economy and efficiency he may discharge any member of the permanent staff. The council for each college will be appointed by the governor-general, the principal and the senate by the minister. At the recommendation of the secretary of his department, the minister may punish misconduct by reprimand, by imposing fines up to £100, by reduction of salary and of grade, or by discharge from the service. Such penalties may be applied to misconduct committed before the staff member, through this Act, became a servant of the State department. Misconduct includes adverse public comment on the administration of any government or provincial department. It is misconduct "to propagate any idea or take part in or identify himself with any propaganda or activity or act in a manner calculated (i) to cause or promote antagonism amongst any section of the population of the Union against any other section of the population of the Union; or (ii) to impede, obstruct, or undermine the activities of any Government department." As Professor Gordon pointed out to the minister, such a provision would place the staff at the mercy of any official who chose to interpret teaching on the social origins of disease as calculated to cause racial antagonism. (For example, in the African widespread malnutrition contributes to a high incidence of cirrhosis of the liver, and the migratory labour system and poor living conditions to the prevalence of tuberculosis and syphilis; these diseases are far less common among the more fortunately placed Europeans.)

In the face of this, by secret ballot 29 of the 31 full-time members of the medical-school staff indicated that they would resign when the Bill was enacted, while all 26 of the part-time staff able to attend a meeting stated that in this event they also could not continue teaching. This unrest was to some extent expressed by a deputation from the South African Medical and Dental Council to the minister. The minister seemed unable to recognise any ground for anxiety or protest, and indeed he thought it the duty of the dean "to lead the staff towards a realisation of their responsibilities to the government and the country." As the medical school was heavily subsidised by the State, he thought the government was entitled to have a large say in its control. He said that there was no intention of changing the status of staff, who would remain professors and lecturers. There would be no reduction in salary, and he could not understand why the staff felt that they would lose prestige if they became Civil Servants. Fears about the provisions for discipline were groundless—the staff would have "to deal with reasonable men who would act with justice, in all circumstances."

Despite these assurances, vigorous protest has been made, not only in Durban, but by departmental heads in the Cape Town medical faculty, and by the Students Medical Council and the Medical Graduates Association of the Witwatersrand University. The federal council of the South African Medical Association has expressed its grave concern. Twenty-six heads of departments in British medical schools wrote jointly to applaud the vigorous opposition to the threat to academic liberty and freedom of thought.

1. *Lancet*, March 30, 1957, p. 675.
2. Further report on the government's intended action to remove the faculty of medicine from the University of Natal, with Preface by Prof. I. Gordon. Durban Medical School, May 4, 1957.

As yet there has been no shift in government policy, and the academic staff at a meeting on May 2 steadfastly resolved that they can give no assurances about retaining their posts, "because we believe that we will be unable to carry out our academic and professional work and fulfil our responsibilities to our students under the conditions which will be established for the higher education of African, Indian, and Coloured persons when the Separate University Education Bill of 1957 is enacted."

CONGRESS IN RUMANIA

FROM May 5 to 11 a National Congress of Medical Sciences of the Rumanian People's Republic was held at Bucharest. The invitation of delegates from all over the world gave the conference an international flavour. Twenty-seven countries were represented, and the British participants were Dr. F. Dudley Hart, Dr. B. H. Kirman, Dr. A. MacPherson, Dr. Bernard Schlesinger, Mr. P. G. Shute, and Dr. Denis Williams.

Prof. C. I. Parhon, the 84-year-old honorary president of the R.P.R. Academy, and formerly President of the Republic, opened the proceedings. The congress was divided into four sections devoted to physiological, rheumatic, neurological, and epidemiological problems. It soon became apparent that acute rheumatism in childhood is still prevalent in Rumania; but on the whole it is milder than the type which was so common in England in the past. Infective hepatitis is also widespread at the moment. On the other hand it seems that malaria has been virtually eradicated—an achievement which must cause considerable satisfaction to Mr. Shute, whose researches in Rumania before the war played no small part in it. In the section of neurology stress was laid on conditioned reflexes and on endocrinological factors. The Bucharest Institute for Endocrinology is a pioneer in this field.

The conference was valuable in enabling medical men from all over the world to pool their ideas, but even more so in bringing them together. In commenting on it one of the British party says: "To be able to discuss China and England with a professor from Peking who had never heard of the National Health Service; to walk back to the hotel with doctors from East and West Germany and obtain an idea of their respective views and ways of life; and to compare medicine in England and Rumania with the colleagues we met—all this helped us to step over the dividing frontiers. Preconceived ideas begin to waver and a way is laid along the precipitous path towards international friendship and peace."

BRITISH EMPIRE CANCER CAMPAIGN'S RESEARCH UNIT IN RADIOBIOLOGY

IN 1954 the British Empire Cancer Campaign received a donation of £25,000 to provide additional laboratories for the study of the effects of X rays and other ionising radiations on living cells; and the new laboratories were opened at the Mount Vernon Hospital, Northwood, by the Duke of Devonshire on May 20. The research unit in radiobiology which will work there is under the direction of Mr. L. H. Gray, PH.D., formerly senior physicist to the Mount Vernon Hospital. The other permanent members of the team are Mr. J. W. Boag, D.SC., Mr. D. L. Dewey, PH.D., Alma Howard, PH.D., and Dr. O. C. A. Scott. At the moment five other scientists from abroad—2 from the United States, 2 from Canada, and 1 from New Zealand—are working at the unit.

Answers to the fundamental problems concerning the action of radiation on living cells are urgently needed, and knowledge is particularly scarce about the early stages of irradiation damage which precede the changes visible under the microscope. The new unit will focus its attention on these early stages, partly because they undoubtedly hold the key to an understanding of what follows and partly because it is at the very earliest stages that there is the best chance of controlling the nature and extent of the damage caused by radiation. One method of studying early effects is to deliver all the radiation energy to the cell in the shortest possible time and to measure the chemical changes which take place in the cell or in isolated cell components at the instant of irradiation and immediately afterwards. For this purpose the unit has an electron-pulse generator, designed by Metropolitan Vickers, which can deliver electrons in very intense bursts. Cells exposed to the beam from the generator can be given any desired amount of radiation, up to a limit exceeding anything previously attained, in a single pulse lasting only about two-millionths of a second. Special methods will be used to examine the changes in the cell during and after exposure by means of flashes of light also lasting only a few millionths of a second. These studies bear closely on the use of oxygen to increase the power of X rays in the treatment of malignant disease, since oxygen is believed to augment radiation damage by participating in chemical reactions of extremely short duration.

The new laboratories have been specially designed to meet the research requirements of the unit. A single-storey section of the building includes two rooms with thick concrete walls, one housing the electron-pulse generator and the other a 200,000-volt X-ray apparatus. Both machines, as well as the analytical instruments which measure the changes in the cells, are operated from a control bay between the two rooms. Another two-storey part of the building contains laboratories and offices, and a large room which serves as library, staff room, and conference room. The laboratories, which have a total floor area of 5500 sq. ft., were designed by Messrs. Waterhouse and Ripley.

GUILD OF HEALTH

A CONFERENCE of 21 doctors and 28 clergy was held at Hoddesdon, from April 29 to May 2, under the auspices of the guild. A study group considered coöperation between doctors and clergy, and reached these conclusions:

Individual doctors and clergy should continue to approach each other for spontaneous coöperation over problems of their daily work.

There is a need for informal discussion-groups of all engaged in work with the sick. Means should be developed for the exchange of opinion and information between all such groups and other bodies studying similar problems.

Local church communities should so develop themselves as to provide a healthy environment which will both tend to prevent breakdowns in health and to aid the rehabilitation of the recovering sick. The importance of this kind of development in "working communities" such as schools, large factories, hospitals, and universities must be noted.

Doctors have a responsibility to participate in this process both as individual members of the community and as possessing special experience of health problems and techniques.

Coöperation of doctors with the church community can be of particular value in preparation for the critical stages of development—e.g., for marriage, childbirth, and the young family, puberty, middle age, and old age.

People in transition from one stage of development to another, or from sickness to health, often need to be members of small groups within the larger framework of the community, and the development of such small groups to meet particular needs is to be encouraged.

It is necessary for clergy to have a better understanding of the medical approach to healing, and for doctors to have a better understanding of the spiritual significance of healing. Plans should therefore be discussed for providing medical-study courses for the clergy, and theological-study courses for doctors, at teaching-school level. Whether such training should be before or after graduation, or both, requires consideration.

B.M.A.'s SCOTTISH HEADQUARTERS

ON May 14, Dr. A. H. Hall, president of the British Medical Association, officially opened the reconstructed Scottish House of the association at 6–7, Drumsheugh Gardens, Edinburgh. The reconstruction was begun in 1954. The hall has been improved and enlarged and now provides handsome accommodation for over 300 for meetings of the association's Edinburgh division and other Edinburgh medical organisations, and for Scottish B.M.A. conferences. There is now a comfortable members' common-room, a dining-room where members and guests can have lunches and teas, and a reading-room. The common-room has a bar under a club licence. The office accommodation for B.M.A. staff has been virtually doubled, and the Medical Insurance Agency now has rooms on the third floor.

Dr. Hall, in declaring the building open, traced the history of the association's premises in Edinburgh from the rooms in Rutland Square, rented in 1909, to the handsome new house. He forecast that the new and enlarged premises would enable the association to discharge better than ever before its duties in furthering scientific, educational, medico-political, and social activities.

University of London

Dr. P. M. Daniel, senior lecturer at the Institute of Psychiatry and honorary consultant neuropathologist at the Maudsley and Bethlem Royal Hospitals, has been appointed to the university chair of neuropathology at the Institute.

Dr. Daniel studied medicine at the University of Cambridge and at Charing Cross Hospital, where he held the T. H. Huxley scholarship. After qualifying in 1942 he held house-appointments at Charing Cross. Soon afterwards he was appointed senior research officer in the department of pathology at the Radcliffe Infirmary, and he was one of the team which made a special study of the renal circulation and described what is familiarly known as the Oxford shunt. In 1948 he was awarded the John Hunter medal of the Royal College of Surgeons of England for his share in this research and for the discovery of afferent nerves and muscle spindles in the

external ocular muscles. He has done experimental work on the circulation through various organs, and also on various problems in neuropathology and comparative pathology including a study of scrapie in sheep which we published last October. In 1949 Dr. Daniel received from the University of Oxford the degree of M.A. and in 1955 the degree of D.M. He remained at Oxford until he took up his present appointment.

On April 10 the following degrees were conferred:

M.D.—J. H. Evans, P. K. Thomas.

University of Oxford

Our list (May 18) of recipients of the degree of D.M. should have included the name of R. T. Turner-Warwick.

University of Sheffield

The title of reader in social and industrial medicine has been conferred on Dr. John Pemberton, at present senior lecturer in social and industrial medicine. Mr. J. A. Griffiths has been appointed part-time instructor in anæsthetics, and Dr. R. E. Church clinical teacher in dermatology.

University of Colorado

Dr. J. D. L. Reinhold, assistant to the director of the department of child health at Guy's Hospital, London, has been appointed assistant professor of pediatrics in the university from July 1.

British Association of Urological Surgeons

The annual meeting of this association will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, from June 27 to 29.

Beit Fellowships for Medical Research

The following elections have been made:

Fourth-year fellowships (£1000)

B. T. Donovan, PH.D. Lond. To study the hypothalamic mechanisms underlying the regulation of the onset of puberty and the mechanisms regulating the onset of œstrus; at the Institute of Psychiatry, Maudsley Hospital, London.

D. S. H. W. Nicol, M.A., M.D. Camb. To continue his investigations of the chemistry and pharmacology of peptide fractions of insulin; at the Dunn Institute of Biochemistry, University of Cambridge.

Junior fellowships (£800 a year)

G. A. J. Goodlad, PH.D. Glasg. To study the effect of the presence of a tumour on the protein metabolism of the host; at the department of biochemistry, University of Glasgow.

I. Oswald, M.A., M.B. Camb. For human electro-encephalographic studies of the rôle of the emotional significance of conditioned stimuli in determining their arousal value during sleep, and the mechanism of inhibition of responses to them; at the Institute of Experimental Psychology, Oxford.

I. C. Roddie, M.B., B.SC. Belf. To study the rôle of high and low pressure receptors of the vascular system in the regulation of the human circulation; at the department of physiology, Queen's University, Belfast.

S. Varadarajan, M.A. Madras, PH.D. Camb. For a comparative study of nucleotide metabolism in cancerous and normal tissue; at the department of radiotherapeutics, University of Cambridge.

Pauline M. Meadow, B.A. Oxfd, PH.D. Lond. To study the structure and mode of synthesis of bacterial cell walls, with special reference to their amino-acid and amino-sugar components; at the department of biochemistry, University College, London.

Anglo-French Medical Bursaries

In the exchange with the Ciba Foundation, bursaries for 1957 have been awarded by the Institut National d'Hygiène to the following:

Dr. G. A. Collie-Kolibabka (general practitioner, Harlow), Dr. F. A. L. da Cunha (consultant obstetrician and gynæcologist, Oldham and Ashton groups of hospitals), Dr. R. J. T. Gardiner (general practitioner, Belfast), Dr. T. H. Morgan (senior orthopædic registrar, Nuffield Orthopædic Centre, Oxford), Dr. W. R. Probert (senior registrar, thoracic surgery, Sully Hospital), Dr. J. T. Shepherd (reader in physiology, Queen's University, Belfast), and Dr. I. McG. Stewart (consultant physician, Blackpool and Fylde hospitals).

More Blood-donors Wanted

On May 15, in launching a drive for over 100,000 new blood-donors, Mr. Dennis Vosper, the Minister of Health, said that there were over 643,000 civilian donors in the National Blood Transfusion Service, but to meet developments in techniques an effective panel of 750,000 donors was needed. Last year over 803,000 donations of blood were given—the largest figure ever recorded and an increase of 44,000 on 1955—and 120,000 new donors gave their blood for the first time. Mr. Vosper was speaking at a showing of a new film, *Blood Is Life*, which tells the story of the organisation of the service. The film (two reels, running for 17 minutes) has been made by the Central Office of Information for the Ministry of Health. It is intended for use in local recruitment campaigns.

Anglo-French Meeting in London

A joint scientific meeting of the Royal College of Surgeons of England and the Académie de Chirurgie de Paris will be held from May 30 to June 1 at the college. Papers and films will be presented by French surgeons, and the rest of the programme will be devoted to relaying by closed-circuit television, in colour, surgical operations from the main theatre of St. Bartholomew's Hospital to the great hall of the college. This will be the first occasion in this country on which colour television has been used for a medical programme of this sort. Attendance at the meetings on May 30 and 31 is by invitation, but, if seats are available, any doctor will be welcome at the meeting on Saturday, June 1, at 10 A.M., when a Dupuytren's contracture will be operated on by Sir Archibald McIndoe and a cardiac operation performed under hypothermia by Sir Russell Brock. Applications for seats should be sent in writing as soon as possible to the secretary of the college, Lincoln's Inn Fields, W.C.2.

Louis Rapkine Association

The second annual meeting of the British section of this association was held on May 6 under the chairmanship of Prof. A. V. Hill, F.R.S. The Abbé Breuil gave a talk on the cave-paintings of Rouffignac in the Dordogne which was illustrated by slides showing some of the paintings and rock carvings of mammoths, horses, ibex, and rhinoceros found in the caves.

The association was founded last year in memory of the French biochemist, Louis Rapkine. Membership is open to British and French doctors and research-workers in the biological sciences who have been awarded scholarships or bursaries to enable them to visit the other country. Information about the association can be had from Dr. G. E. Wolstenholme, Ciba Foundation, 41, Portland Place, London, W.1, or from Miss A. M. Vidal-Hall, scientific office, French Embassy, 22, Wilton Crescent, S.W.1.

Faculty of Ophthalmologists

The following have been elected officers of this society for 1957–58:

President, Mr. L. H. Savin; immediate past-president, Dr. John Marshall; vice-presidents, Mr. E. G. Mackie and Prof. G. I. Scott; hon. treasurer, Mr. A. McKie Reid; hon. secretary, Mr. E. F. King.

Islington Family Planning Clinic

A photograph of the late Dr. Joan Malleson was unveiled at this clinic on May 22. Dr. Malleson was one of those who helped to found the clinic in 1934, and as clinic consultant she was associated with its work until her death last year.

Award for Malaria Research

At a sitting of the World Health Assembly on May 15, Dr. Paul F. Russell, of the Rockefeller Foundation, was awarded the Darling Foundation medal and prize for his work on the control of malaria.

Appointments

BOWEN, L. W., M.B. Lond., D.P.M.: senior assistant psychiatrist, Saxondale Hospital, Radcliffe-on-Trent.

FYNNE, MARGARET, M.B. Dubl., D.P.H.: senior M.O. for mental health, Derbyshire.

HAIGH, R. D., M.B. Leeds, D.P.H., D.OBST.: M.O.H. and deputy principal school M.O., Bolton.

HAMPSON, FRANK, D.M. Oxfd: consultant pathologist, Reading area department of pathology.

HANNAH, R. H., M.B. Edin., F.R.C.S.E.: consultant neurosurgeon, United Liverpool Hospitals.

MCCULLOUGH, ISABEL M., L.R.C.P.I., D.C.H., D.OBST.: senior maternal and child welfare M.O., Derbyshire.

MCDONALD, MARY G., M.B. Aberd., D.P.H.: M.O., mobile clinic, North Riding of Yorkshire.

SERJEANT, J. C. B., T.D., M.B. Edin., F.R.C.S.: senior casualty officer, West Cumberland group of hospitals.

Liverpool Regional Hospital Board:

BURROWS, M. M., M.B. Belf., F.F.A.R.C.S., D.A.: consultant anæsthetist, St. Catherine's Hospital, Birkenhead.

HOPKINS, C. A., M.B. Lpool, M.R.C.P.: tuberculosis M.O., Liverpool and district eastern H.M.C. area.

LAMB, W. R., M.B. Dubl., F.R.C.S., F.F.A.R.C.S.: consultant anæsthetist, St. Helens and Warrington groups of hospitals.

The Hospital for Sick Children, Great Ormond Street, London:

ABERDEEN, EOIN, M.B. Melb., F.R.C.S., D.C.H.: senior surgical registrar, thoracic unit.

GARDNER, D. C., M.B. Lond.: house-surgeon, orthopædic and plastic departments.

GUHA, S. K., M.B. Calcutta: resident registrar, ear, nose, and throat department.

SCOTT, J. E., M.B. Camb., F.R.C.S.: surgical registrar.

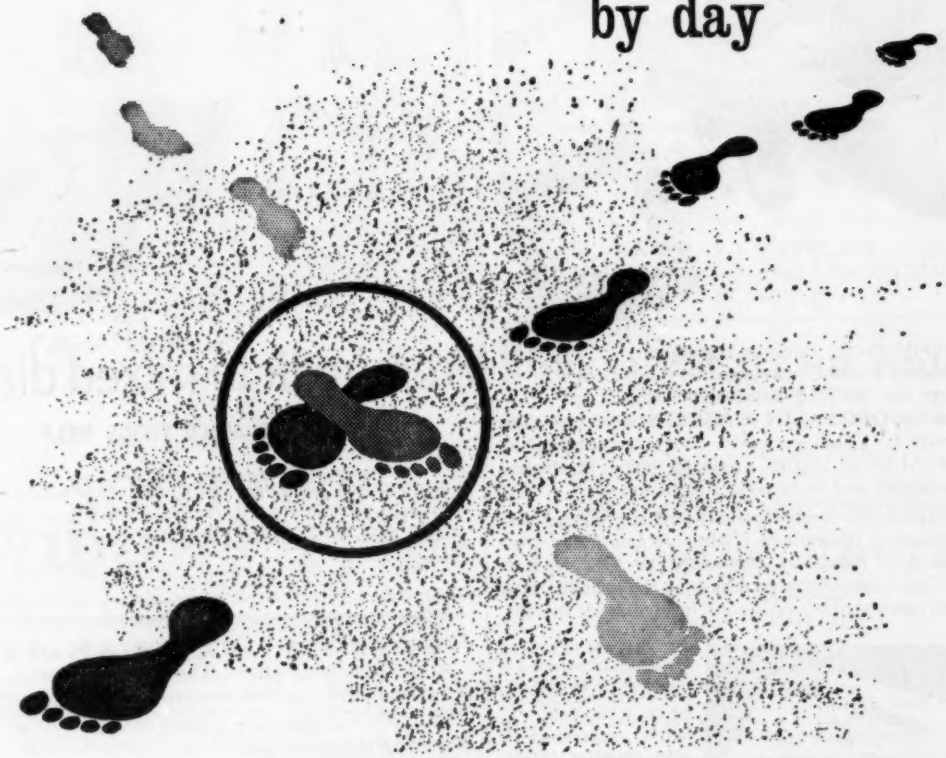
WILSON, E. P., M.B. Adelaide, D.C.H.: house-physician.

'ASTEROL'

For TINEA PEDIS

TINCTURE supplemented
by **POWDER** for dusting
into socks and stockings

by day



and **OINTMENT**

at night

Packings: **ASTEROL TINCTURE** (5 per cent) is available in bottles of 30 c.c. and 250 c.c.
ASTEROL OINTMENT (5 per cent) is available in tubes of 25 g.
ASTEROL POWDER (5 per cent) is available in tins of 30 g.

ROCHE PRODUCTS LIMITED · 15 MANCHESTER SQUARE · LONDON · W.1

33

Droxalin palatability in peptic ulcer

IN PEPTIC ULCER, carefully regulated medication is often interrupted by the patient's distaste for an acid adsorbent. Bland and palatable, DROXALIN TABLETS overcome this difficulty. The patient's ready acceptance of DROXALIN is also of particular value in treating Hyperacidity and Sickness of Pregnancy.

DROXALIN combines the two most preferred acid adsorbents — Aluminium Hydroxide and Magnesium Trisilicate. Pleasantly flavoured, the DROXALIN tablet has none of the grittiness or the metallic taste usually associated with Aluminium Hydroxide therapy.

DROXALIN TABLETS are hygienically packed in film seals of six, enabling patients to carry them in pocket or handbag.

ACTIVE INGREDIENTS IN EACH DROXALIN TABLET:

Gelat. Alumin. Hydrox. Sicc. ..... **2.5 grains**
Mag. Trisil. .... **2.5 grains**

SAMPLES FOR CLINICAL TRIAL ARE AVAILABLE ON REQUEST.

DROXALIN
Tablets
ACID ADSORBENT

SCOTT & TURNER LTD., ANDREWS HOUSE, NEWCASTLE UPON TYNE

From milk to mixed diet

HOW HEINZ STRAINED FOODS HELP

Mothers of three or four-month-old babies often need your practical advice about how to start baby on a mixed diet.

When you suggest Heinz Strained Foods you can do so with complete confidence. The 19 different foods, introduced gradually from about three-months onwards, between them offer scope for a varied diet. They are cooked and strained under strictly controlled conditions, with the minimum loss of food values. And, of course, they are prepared much more hygienically than they would be in an ordinary kitchen.

For full details of the nutrient values of the 19 varieties of Heinz Strained Foods, write to Dept. T2, H. J. Heinz Co. Ltd., Harlesden, London N.W.10.

HEINZ 57
Strained Foods

MEAT BROTHS · SOUPS · VEGETABLES · SWEETS · CEREAL

H. K. LEWIS & Co. Ltd.

MEDICAL PUBLISHERS AND BOOKSELLERS

TEXTBOOKS AND WORKS IN MEDICAL, SURGICAL AND GENERAL SCIENCE OF ALL PUBLISHERS

Catalogues on application. Please state interests.

FOREIGN BOOKS : Continental and American books obtained to order.

SECOND-HAND BOOKS : A constantly changing large stock of Medical and Scientific Literature on view, classified under subjects.

MEDICAL AND SCIENTIFIC LENDING LIBRARY

Annual Subscription from £1 17s. 6d. Prospectus on application

The Library Catalogue revised to December, 1949, containing a classified Index of Authors and Subjects. Pp. xii+1152. To subscribers 10s. net ; to non-subscribers 17s. 6d. net ; postage 1s. 9d.

Supplement 1950–52. To subscribers 1s. 6d. net ; to non-subscribers 3s. net ; postage 9d.

New edition of the Catalogue revised to December, 1956, is in course of preparation.

H. K. LEWIS & Co. Ltd., 136 GOWER STREET, LONDON, W.C.1. Phone : EUSton 4282

YOUR CHILD

In your plans for your child's education and career life assurance can be a real help. Write today for a copy of the New "Career Policy" leaflet to

SCOTTISH WIDOWS' FUND

Head Office: 9 St. Andrew Square, Edinburgh, 2
London Offices: 28 Cornhill, E.C.3 17 Waterloo Place, S.W.1

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 7 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone : Norwich 20080

PORTABLE X-RAY UNITS

SENSATIONAL OFFER

A large Ministry purchase of slightly used G.E.C. VICTOR PORTABLE X-RAY UNITS enables us to offer you the opportunity to possess your own X-Ray Unit, at a fraction of to-day's price.

COMPACT—POWERFUL—SIMPLE TO USE—ECONOMICAL with QUALITY RESULTS

Offered at £100. Complete with portable stand. Every unit guaranteed.

For further details write, call or phone :

STANDARD SUPPLIES

19, Eversholt Street, Euston Road, LONDON, N.W.1

Phone : EUSTON 2509

NORTHUMBERLAND HOUSE

Psychiatric Nursing Home

235-7 BALLARDS LANE, N.3 **Tel. : FINchley 5283**

Resident Med. Director Dr. R. M. RIGGALL, Mem. Brit. Psycho-Analytical Socy.

Deep insulin coma unit, psychotherapy, etc.

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone : PINNER 234

Private Nursing Home for Mental and Nervous illness. All modern forms of treatment. Two country houses in adjoining grounds of 5 and 6 acres respectively, 12 miles from London. Trains every 15 minutes from Baker Street to Pinner.

DOUGLAS MACAULAY, M.D., D.P.M.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres in the same grounds. **ROWDENS**, a comfortable house with lovely views. Private road to the beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete Indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION : £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), **Victory House, Leicester Sq., W.C.2.** Gerrard 4553 and 4814

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Piombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 38

ANÆSTHETICS

Central Middlesex, N.W.10. Sr. H.O. 41
Hackney Group H.M.C. Sr. H.O. 41
Lambeth, S.E.11. Reg. 42
London Chest, E.2. Reg. 41
Metropolitan, E.8. Sr. H.O. 42
North West Met. R.H.B. P.-t. Cons. 39
St. Mary's, W.2. Sr. H.O. 43
Aberdeen Gen. Hosps. B.O.M. Jr. H.M.O. 43
Barnsley. Beckett. Reg. 44
Birmingham Accident. Sr. H.O. 44
Birmingham R.H.B. Locum Reg. 44
Bournemouth & East Dorset Group of Hosps. Reg. 44
Bournemouth. Royal Victoria. Sr. H.O. 44
Burton-on-Trent Gen. Sr. H.O. 45
Bury & Rossendale H.M.C. Sr. H.O. 45
Cardiff. United Hosps. Reg. 45
Carshalton. Queen Mary's Hosp. for Child. Locum Reg. 45
Colchester Group H.M.C. Sr. H.O. 45
Doncaster Royal Infy. Sr. H.O. 46
Halifax Royal Infy. Sr. H.O. 46
Hitchin Hosps. Sr. H.O. 46
Ipswich & East Suffolk. Sr. H.O. 46
Isleworth. West Middlesex. Reg. 47
Leeds R.H.B. Locum Sr. H.M.O. 39
Leeds R.H.B. Reg. 47
Leeds R.H.B. P.-t. Cons. 39
Liverpool United Hosps. Sr. H.O.'s 47
Reading. Royal Berks. Sr. H.O. 49
Rochdale Infy. Sr. H.O. 50
Scotland. South-Eastern R.H.B. Reg. 50
Scotland. Western R.H.B. Reg. 50
South East Met. R.H.B. P.-t. Cons. 40
Stafford. Staffordshire Gen. Infy. Sr. H.O. 51
Stockport. Stepping Hill. Sr. H.O. 51
Worthing Group H.M.C. Reg. 53
York. County, City, Military & Fulford Hosps. Sr. H.O. 53
St. John's, Newfoundland, Canada. Gen. Residency 53
U.S.A. Cambridge, Mass. Residencies 53

CARDIOLOGY

National Heart, W.1. Sr. H.O. 42
Newcastle Gen. H.O. 49

CASUALTY

Battersea Gen., S.W.11. H.O. or Sr. H.O. 41
Connaught, E.17. Sr. H.O. 41
German, E.8. Sr. H.O. 41
Hampstead Gen., N.W.3. Sr. H.O. & Pre-reg. H.O. 41
Prince of Wales's Gen., N.15. Sr. H.O. 42
Bebington. Clatterbridge. Jr. H.M.O. or Locum 44
Blackpool. Victoria. Jr. H.M.O. 44
Colchester Group H.M.C. Sr. H.O. & Reg. (Temp.) 45
Croydon Gen. Reg. & Sr. H.O. 45
Edgware Gen. Locum Jr. H.M.O. 46
Halifax Royal Infy. Sr. H.O. 46
Hastings. Royal East Sussex. Sr. H.O. 46
Liverpool United Hosps. Sr. H.O. 47
Mexborough. Montagu. Locum Sr. H.O. 48
Plymouth. South Devon & East Cornwall. Sr. H.O. 49
Reading & Dist. H.M.C. Sr. H.O. 49
Rhyl. Royal Alexandra. Sr. H.O. 49
Salisbury Gen. Sr. H.O. 50
St. Helens & Dist. H.M.C. Sr. H.O. 51
Stockton & Thornaby. Sr. H.O. 52
Sunderland. Royal Infy. Sr. H.O. 51
Swansea. Morriston. Sr. H.O. 51
Tynemouth. Victoria Jubilee Infy. Jr. H.M.O. or Sr. H.O. 52
Wallasey. Victoria Central. Jr. H.M.O. 52
Windsor. King Edward VII. Sr. H.O. 52

CHEST AND TUBERCULOSIS

Brompton, S.W.3. H.O.'s 41
Brompton, S.W.3. P.-t. Cons. 39
London Chest, E.2. H.O.'s 41
North Middlesex Hosp. & Edmonton Chest Clinic, N.18. Sr. H.O. 42
Birmingham R.H.B. Reg. 44
Chelmsford. Broomfield. Locum Sr. H.M.O. 39
Halifax. Northowram Hall. Sr. H.O. 46
Ilkley. Middleton. Sr. H.O. 46
Portsmouth Group H.M.C. Sr. H.O. 49
Southend-on-Sea H.M.C. Locum Sr. Reg. 51

DERMATOLOGY

Liverpool United Hosps. Locum Reg. 47
North East Met. R.H.B. P.-t. Cons. 39

EAR, NOSE, AND THROAT

Royal National T.N. & E., W. H.O. 42
Whipps Cross, E.11. Sr. H.O. 43
Birmingham & Midland Ear & Throat. Sr. H.O. & H.O. 44
Birmingham R.H.B. Temp. P.-t. Cons. 39
Hull A Group H.M.C. Sr. H.O. 46
Ipswich & East Suffolk. H.O. 47
Liverpool United Hosps. Sr. H.O.'s 47
North Gloucestershire Clinical Area. Cons. 40
Reading & Dist. H.M.C. Sr. H.O. 49
Salisbury Gen. Reg. 50
Scotland. South-Eastern R.H.B. P.-t. Cons. 40
Southend Gen. Locum Reg. 51
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 51
Taunton & Somerset. H.O. 52
New Zealand. Timaru Public Hosp. P.-t. Surgeon 40

GERIATRICS

Croydon. Queen's. Sr. H.O. 45
Newcastle Gen. H.O. 49
Orpington, Kent. Sr. H.O. 49
Watford. Shrodells. Sr. H.O. 52

INFECTIOUS DISEASES

Neasden, N.W.10. Locum Sr. H.M.O. 39
St. Ann's Gen., N.15. Sr. H.O. 42
St. George's, S.W.1. Reg. 42
Birmingham R.H.B. Reg. 44
Leeds R.H.B. Reg. 47
Liverpool. Rathbone. Sr. H.O. 47
Portsmouth Group H.M.C. Sr. H.O. 49

MEDICINE

Camberwell H.M.C. H.O.'s 41
German, E.8. H.O. 41
Hackney, E.9. Pre-reg. H.O. 41
Hosp. of St. John & St. Elizabeth, N.W.8. H.O. 41
Lambeth, S.E.11. H.O. 42
London Jewish, E.1. H.O. 42
Princess Beatrice, S.W.5. Sr. H.O. 42
Putney, S.W.15. H.O. 42
Royal Free Hosp. Group. Sr. H.O. 42
St. Bartholomew's, E.C.1 & North East Met. R.H.B. Sr. Reg. 42
St. Leonard's, N.1. Sr. H.O. & H.O. 43
St. Mary's, W.2. Sr. H.O. 43
Whittington, N.19. H.O.'s 43
Woolwich Group H.M.C. H.O.'s 43
Accrington. Victoria. H.O. 43
Altrincham Gen. Pre-reg. H.O. 43
Birmingham United Hosps. Sr. H.O. 44
Colchester Group H.M.C. Sr. H.O. (Temp.) 45
Derby. Derbyshire Royal Infy. Pre-reg. H.O. or Sr. H.O. 45
Edgware Gen. H.O. 46
Epping. St. Margaret's. Sr. H.O. 46
Hertford County. H.O. 46
Ipswich & East Suffolk. H.O. 47
Leeds R.H.B. Reg. 47
Liverpool United Hosps. Sr. H.O.'s 47
Manchester R.H.B. Reg. 48
Newcastle Gen. H.O.'s 49
Newmarket Gen. H.O. 48
Nottingham Gen. Pre-reg. H.O.'s. 48
Plymouth. South Devon & East Cornwall. Pre-reg. H.O.'s. 49
Reading Area Dept. of Med. H.O.'s 49

Richmond, Yorks. St. John of God's. Jr. H.M.O. 50
Rochford, Essex. Gen. Locum H.O. 50
Salisbury Gen. H.O. 50
Scotland. South-Eastern R.H.B. Reg. 50
Sheffield United Hosps. Sr. H.O. .. 50
Southport Gen. Infy. H.O. 51
Southport Promenade. Sr. H.O. .. 51
Stockport Infy. Locum Sr. H.O. .. 51
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O.'s 51
Taunton H.M.C. P.-t. Med. Supt. .. 40
West Bromwich & Dist. H.M.C. P.-t. Clin. Asst. 52
Windsor. King Edward VII. H.O. .. 52
Wolverhampton. Royal. Pre-reg. H.O.'s 52

NEUROLOGY
Sheffield United Hosps. Reg. .. 50

NEUROSURGERY
Whittington, N.19. H.O. 43
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 45
Romford. Oldchurch. Sr. H.O. .. 50

OBSTETRICS AND GYNÆCOLOGY
Lambeth, S.E.11. H.O. 42
Royal Free, W.C.1. Sr. Reg. 42
St. James', S.W.12. Locum Reg. & H.O. 42
St. Thomas's, S.E.1, & South West Met. R.H.B. Sr. Reg. 43
Wanstead, E.11. H.O. 43
Whittington, N.19. H.O. 43
Birmingham R.H.B. Reg. 44
Blackburn, Queen's Park. H.O. .. 44
Bolton Dist. Gen. Sr. H.O. 44
Bournemouth. Royal Victoria. Reg. 44
Bromsgrove Gen. H.O. 45
Burton Gen. & Andressey. H.O. 45
Canterbury. Kent & Canterbury. H.O. 45
Edgware Gen. H.O.'s 46
Grimsby Group of Hosps. Reg. .. 46
Isleworth. West Middlesex. Sr. H.O. 47
Kettering. St. Mary's. Sr. H.O. .. 47
Leamington Spa. Warneford Gen. H.O. 47
Lennoxtown, Stirling. Lennox Castle Maty. Jr. H.M.O. 47
Liverpool United Hosps. Sr. H.O.'s 47
Manchester United Hosps. Sr. H.O. & H.O.'s 48
Manchester. Withington. Pre-reg. H.O. 48
Newcastle upon Tyne H.M.C. & Hexham & Dist. H.M.C. Pre-reg. H.O.'s 48
Nottingham City. Sr. H.O. or H.O. 48
Pontypridd. East Glamorgan. Sr. H.O. 49
Reading Combined Hosps. H.O. .. 49
Romford. Rush Green. H.O. .. 50
Shrewsbury. Cross Houses. Pre-reg. H.O. 50
St. Albans City. Jr. H.M.O. .. 51
St. Albans City. Locum Reg. .. 51
Stockport. Stepping Hill. Sr. H.O. 51
Taunton & Somerset. Sr. H.O. .. 52
West Bromwich & Dist. H.M.C. P.-t. Clin. Asst. 52

OPHTHALMOLOGY
St. James', S.W.12. P.-t. Reg. .. 42
Aylesbury. Royal Bucks. H.O. 43
Derby. Derbyshire Royal Infy. Sr. H.O. 46
Liverpool United Hosps. Sr. H.O.'s 47
Manchester United Hosps. Sr. H.O., H.O. & Pre-reg. H.O. 48
Romford Group H.M.C. P.-t. Clin. Asst. 50
Scotland. South-Eastern R.H.B. Reg. 50
Swansea. Sr. H.O. 52
Welsh R.H.B. Sr. H.M.O. 40
Wolverhampton & Midland Counties Eye Infy. Sr. H.O. 52

ORTHOPÆDICS
Albert Dock Orthopædic & Fracture, E.16. Sr. H.O. 41
Camberwell H.M.C. H.O. 41
Hammersmith Hosp. & P.G. Med. School, W.12. Locum Reg. .. 41
Queen Mary's (Roehampton), S.W.15. Reg. 42
Royal Northern, N.7. Sr. H.O. .. 42
Ashford, Middx. H.O. 43
Bournemouth. Royal Victoria. Sr. H.O. 44
Brighton Gen. Sr. H.O. & H.O. .. 45
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 45
Coventry & Warwickshire. Jr. H.M.O. 45
Crewe & Dist. Mem. Sr. H.O. .. 45
Doncaster Royal Infy. Sr. H.O. .. 46
Ipswich & East Suffolk. H.O. .. 47
Leeds R.H.B. Regs. 47
Liverpool United Hosps. Sr. H.O.'s 47
Romford. Oldchurch. H.O. 50
Sheffield. City Gen. Locum Sr. H.O. 51
Sheffield United Hosps. Reg. .. 50
Southampton. Royal South Hants. H.O. 51
Stoke-on-Trent. North Staffs Royal Infy. H.O. 51
Wakefield. Pinderfields Gen. Sr. H.O. & H.O.'s 52
Welsh R.H.B. Reg. 52
Woking. Rowley Bristow Orthopædic. H.O. 52
St. John's, Newfoundland, Canada. Gen. Residency 53

PÆDIATRICS
Whittington, N.19. H.O. 43
Derby. Derbyshire Child's. Sr. H.O. 46
Hull A Group H.M.C. H.O. 46
Leeds R.H.B. P.-t. Cons. 39
Liverpool United Hosps. Sr. H.O.'s 47
Luton & Dunstable. H.O. 47
Manchester United Hosps. H.O. .. 48
Newcastle Gen. H.O.'s 49
Salisbury Gen. H.O. 50
Shrewsbury. Royal Salop Infy. Sr. H.O. or H.O. 50

PATHOLOGY
Royal Marsden, S.W.3. Sr. H.M.O. .. 39
Birmingham R.H.B. Regs. 44
Birmingham United Hosps. Sr. H.O. 44
Liverpool United Hosps. Sr. H.O.'s 47
Oxford R.H.B. Reg. 49
Oxford United Hosps. Reg. 49
Plymouth. South Devon & East Cornwall Gen. Hosp. Group. Sr. H.O. 49
Sheffield United Hosps. Reg. .. 50
South West Met. R.H.B. Locum Sr. H.M.O. 40
Walsall H.M.C. Jr. H.M.O. 52
Wolverhampton Group. Jr. H.M.O. 53
Dublin. Royal City Hosp. & Dr. Steevens' Hosp. Pathologist. .. 40

PLASTIC SURGERY
Chepstow. St. Lawrence. Sr. H.O. .. 45
Nottingham City. Sr. H.O. 48

PSYCHIATRY
North East Met. R.H.B. P.-t. Cons. & P.-t. Sr. H.M.O. 39
Aberdeen Mental Hosps. Sr. H.O.'s & H.O.'s 43
Birmingham. All Saints'. Reg. & Sr. H.O. 44
Birmingham R.H.B. Sr. H.M.O. .. 39
Canterbury. St. Augustine's. Locum Cons. 39
Crowthorne, Berks. Broadmoor Institution. Med. Supt. (Cons.) .. 39
Derby. Pastures. Jr. H.M.O. .. 46
East Anglian R.H.B./United Cambridge Hosps. Sr. H.M.O. .. 39
Leeds R.H.B. Locum Sr. H.M.O. .. 39
Lincoln. Lawn. Jr. H.M.O. or Locum 47
Macclesfield. Parkside H.M.C. Reg. 48
Macclesfield. Parkside Mental. Jr. H.M.O. 47
Newcastle R.H.B. Cons. 40
Newcastle R.H.B. Regs. 48
Oxford. Warneford & Park Hosps. M.C. Sr. H.O. 49
Scotland. South-Eastern R.H.B. Sr. Reg. 50
South West Met. R.H.B. Locum Sr. H.M.O. 40
Sheffield R.H.B. Sr. H.M.O. .. 40
St. Albans. Harperbury. Reg. .. 51
Virginia Water, Surrey. Holloway San. Locum Reg. 52
Wigan. Billinge. Reg. 52
Woodford Bridge, Essex. Claybury. Sr. H.O. 53
U.S.A. Virginia. Physicians .. 41
U.S.A. Virginia. Staff Physicians .. 40

RADIOLOGY
King's College Hosp., S.E.5. Sr. Reg. 41
University College Hosp., W.C.1. Reg. or Sr. H.O. 43
Birmingham R.H.B. Reg. 44
Brighton & Lewes H.M.C. P.-t. Locum 39
Liverpool United Hosps. Sr. H.O.'s 47
Manchester R.H.B. Sr. H.M.O. .. 39
Scotland. South-Eastern R.H.B. Reg. 50
Sheffield United Hosps. & R.H.B. Sr. Regs. 50
Dublin. St. Laurence's. Director .. 40
New Zealand. Palmerston North Hosp. Board. Sr. or Jr. Specialist .. 41

RADIOTHERAPY
Hammersmith Hosp. & P.G. Med. School, W.12. H.O.'s 41
Westminster, S.W.1. Research Asst. (Reg.) 43
Brighton. Royal Sussex County. Locum Cons., Sr. Reg. or Reg. .. 39
Leeds R.H.B. Reg. 47
Leeds United Hosps. Reg. 47
Liverpool R.H.B. Sr. Reg. 47
Oxford R.H.B. Locum Cons. .. 39
Sheffield. National Centre for Radiotherapy. Sr. H.O. or Reg. 51
South West Met. R.H.B. Cons. .. 40

SURGERY
Camberwell H.M.C. H.O.'s 41
Highlands Gen., N.21. H.O. .. 41
South East Met. R.H.B. Reg. .. 43
St. Ann's Gen., N.15. H.O. 42
St. Leonard's, N.1. H.O. 43
St. Mary's, W.2. P.-t. Sr. H.O.'s .. 42
St. Mary's Hosp. for Women & Child., E.13. Pre-reg. H.O. .. 43
St. Thomas's, S.E.1. Sr. Reg. .. 43
Westminster, S.W.1. Locum Sr. Reg. 43
Whittington, N.19. H.O.'s 43
Woolwich Group H.M.C. H.O.'s .. 43
Altrincham Gen. Pre-reg. H.O. .. 43
Altrincham Gen. Sr. H.O. 43
Ashford, Middx. H.O. 43
Aylesbury. Royal Bucks. H.O. or Sr. H.O. 43
Bedford Gen. H.O. 44
Birmingham Accident. H.O.'s .. 44
Birmingham R.H.B. Reg. 44
Bournemouth. Royal Victoria. H.O. 44
Carshalton. St. Helier. H.O. .. 45
Castleford. Normanton & Dist. Sr. H.O. 45
Chertsey. St. Peter's. Pre-reg. H.O. 45
Chichester. Royal West Sussex. H.O. 45
Croydon. Mayday. Reg. 45
Croydon. Mayday. Pre-reg. H.O.'s 45
Derby. Derbyshire Child's. Pre-reg. H.O. or Sr. H.O. 46
Derby. Derbyshire Royal Infy. Pre-reg. H.O. or Sr. H.O. 46
Driffield. East Riding Gen. Sr. H.O. 46
Farnborough, Kent. Pre-reg. H.O. 46
Hastings. Royal East Sussex. Pre-reg. H.O. 46
Hemel Hempstead. West Herts. Pre-reg. H.O. 46
Hertford County. Pre-reg. H.O.'s. . 46
Hove Gen. Sr. H.O. 46
Huntingdon County. H.O. 46
Ipswich & East Suffolk. H.O. .. 46
Leeds R.H.B. Regs. 47
Maidenhead. Pre-reg. H.O. 47
Maidstone. West Kent Gen. Pre-reg. H.O. 47
Manchester. Withington. Sr. H.O. .. 48
Newcastle Gen. H.O.'s 49
Newton Abbot. Sr. H.O. 48
North West Met. R.H.B. Reg. .. 48
Nottingham. City. Reg. 48
Nottingham Gen. H.O.'s 48
Nottingham. Highbury. Sr. H.O. .. 48
Plymouth. South Devon & East Cornwall. Pre-reg. H.O.'s 49
Portsmouth Group H.M.C. Pre-reg. H.O. 49
Reading. Battle. H.O. 49
Reading. Royal Berks. H.O. .. 49
Redhill. East Surrey. H.O. 49
Redhill. East Surrey. Sr. H.O. .. 49
Romford. Oldchurch. H.O.'s .. 50
Romford. Victoria. H.O. 50
Salford Royal. Sr. H.O. 50
Salisbury Gen. H.O. 50
Scotland. Eastern R.H.B. Cons. .. 40
Scotland. Western R.H.B. Reg. .. 50
Slough. Upton. Locum Sr. Reg. .. 51
Slough. Upton. Pre-reg. H.O. .. 51
Southampton Gen. H.O. 51
Southend-on-Sea Gen. H.O. .. 51
Southport Gen. Infy. H.O.'s .. 51
St. Albans City. H.O. 51
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 51
Taplow. Canadian Red Cross Mem. Reg. & Pre-reg. H.O. 52
Taunton & Somerset. Sr. H.O. .. 52
Taunton & Somerset. H.O. 52
Wakefield. Clayton. H.O. 52
Welsh R.H.B. Locum Cons. 40
Windsor. King Edward VII. H.O. & Pre-reg. H.O. 52
St. John's, Newfoundland, Canada. Gen. Residency 53

THORACIC SURGERY
Brompton, S.W.3. Sr. H.O. or Reg. 41
London Chest, E.2. Reg. 42
Leeds United Hosps./R.H.B. Reg. 47
Nottingham City. Sr. H.O. 48
Southampton Chest. Reg. t. 51
Wakefield. Pinderfields Gen. H.O.'s 52

UROLOGY
Manchester R.H.B. P.-t. Cons. .. 39

PUBLIC APPOINTMENTS 53

GENERAL PRACTICE 54

NON-MEDICAL 54

MISCELLANEOUS 54

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

FRANK PATRICK LEE LANDER, Esq., O.B.E., M.D., F.R.C.P., will deliver the MITCHELL LECTURE on TUESDAY, 28TH MAY, 1957, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "Rest and Pulmonary Tuberculosis."

Any member of the Medical Profession admitted on presentation of card.

By Order of the President,
HAROLD BOLDERO, Registrar.

UNIVERSITY OF LONDON

A LECTURE entitled "Recent Developments in Diagnosis and Treatment of Human Brucellosis" will be delivered by DR. M. RUIZ CASTAÑEDA (Hospital General, Mexico) at 5.30 P.M. on 4TH JUNE at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF GLASGOW
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

COURSES IN GENERAL MEDICINE, GENERAL SURGERY AND THE VARIOUS SPECIALTIES

The Committee is prepared to consider applications from suitably qualified medical practitioners for postgraduate instruction. Preference will be given to those who are proceeding to higher qualifications.

An applicant who is accepted will be attached to clinical units in teaching hospitals in Glasgow for a period of 3 months. Provision will be made to enable the postgraduate student to obtain intensive clinical experience by sharing in the day-to-day routine of diagnosis and treatment. Emphasis will be placed on clinical methods and bedside discussion.

A limited number of vacancies are now available. The fee will be £10 per month.

Applicants should write to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, stating age, qualifications and professional experience and enclosing 2 testimonials from Senior Clinicians with whom they have recently been associated.

THE UNIVERSITY OF LEEDS

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A COURSE for the Diploma in Psychological Medicine will commence in OCTOBER, 1957, if sufficient entries are received. Instruction will be part-time and will occupy 1½ days a week during 8 academic terms (2½ years).

Further particulars may be obtained from the Secretary, School of Medicine, Thoresby-place, Leeds, 2, to whom application for admission to the course should be sent as soon as possible.

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE

FINAL F.R.C.S.—NOVEMBER, 1957

A COURSE will be held for the above examination on Tuesday and Thursday evenings at 6.30 P.M., starting on TUESDAY, 3RD SEPTEMBER, 1957, and ending on THURSDAY, 24TH OCTOBER, 1957.

The course will consist of 16 clinical tutorial classes with short cases, followed by lecture-demonstrations on selected subjects. The course is not comprehensive. The class will be limited to 24 members.

Fee: 20 guineas, or to Barts men 15 guineas.

Applications to the Sub-Dean, St. Bartholomew's Hospital Medical College, West Smithfield, E.C.1.

THE WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY

ST. MARY'S HOSPITAL MEDICAL SCHOOL, London, W.2

A COURSE of 4 ALMROTH WRIGHT LECTURES has been arranged for the SUMMER SESSION, 1957. The remaining Lectures will be given on the following dates in the Lecture Theatre of this Institute at 5 P.M.

Tuesday, 28th May
Dr. J. F. LOUTIT (Atomic Energy Research Establishment, Harwell) .. "The Immune Response following X-Irradiation."

Tuesday, 4th June
Dr. R. M. FRY (Public Health Laboratory, Cambridge) .. "The Spread of Infections in Hospitals and Institutions."

These Lectures are open to all members of the Medical Profession and to all Students in Medical Schools without fee.

MENTAL HEALTH RESEARCH FUND FELLOWSHIPS

Applications are invited for Mental Health Research Fund Fellowships from suitably qualified persons wishing to pursue Full-time Research Work bearing on problems of mental health whether in clinical psychiatry or in one of its supporting sciences.

Both Junior and Senior Fellowships are offered in the salary ranges £700–£1200 and £1200–£2000, plus superannuation. The appointments will be for up to 3 years in the first instance.

Application forms, which must be returned before 1st October, 1957, may be obtained, together with further information, from the Secretary, Research Committee, Mental Health Research Fund, 39, Queen Anne-street, London, W.1 (Tel.: WELbeck 1272).

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 1ST JULY, 1957. The following Examination will be held in December, 1957.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

EMPIRE RHEUMATISM COUNCIL. Applications are invited for a TRAVELLING FELLOWSHIP in 1958 tenable for up to 1 year, to prosecute research on some aspect of the Rheumatic Diseases. Medical or scientific qualifications are required. Salary according to qualifications and experience, but not less than £1000 p.a. (for lesser period than 1 year, pro rata).

Applications, stating age, qualifications and experience, should be sent in triplicate with the names of 2 referees, not later than 31st August, 1957, to the A/General Secretary, Empire Rheumatism Council, Tavistock House (N), Tavistock-square, W.C.1.

ST. MARY'S HOSPITAL MEDICAL SCHOOL. Applications are invited for the appointment of ASSISTANT LECTURER IN PHYSICS for a period of 3 years. Present salary scale £600–£50–£700 but under revision from 1st August. Superannuation under the F.S.S.U. and children's allowances. The successful candidate will be expected to take part in research on the biophysics of the circulation of the blood.

Applications (in duplicate), with the names of 2 referees, to be sent by 15th June, 1957, to the Secretary, St. Mary's Hospital Medical School, Paddington, W.2, from whom further particulars can be obtained.

UNIVERSITY COLLEGE LONDON (Gower-street, W.C.1) requires Full-time RESEARCH ASSISTANT (Man or Woman) in the Department of Anatomy (Professor J. Z. Young) for work mainly on the central nervous system. Duties to commence as soon as possible. Preference to candidates with Honours Degree in medical sciences or biology; knowledge of German desirable. Salary £600 p.a. (under review), with family allowances.

Applications, to be received by 10th June, 1957, should be sent to the Secretary, from whom further particulars may be obtained.

THE UNIVERSITY OF SHEFFIELD. The Boots Medical RESEARCH FELLOWSHIP, of the annual value of £1000, will be vacant as from 1st October, 1957. The Fellow (who must be medically qualified) is required to undertake research in 1 of the following fields: Pharmacology, Therapeutics, Pathology, Bacteriology, Medicine, Surgery, or Obstetrics and Gynæcology; and the research must normally be carried out in, or under the supervision of the Head of, 1 of the Departments of the Faculty of Medicine in the University of Sheffield. Tenure of the Fellowship is on a yearly basis, but will normally be continued (subject to satisfactory work) up to a limit of 3 years.

Applications (10 copies), including the names and addresses of 3 referees, should reach the Registrar, The University, Sheffield, 10, by 15th June, 1957.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a full-time post of LECTURER IN FORENSIC MEDICINE to begin duties as soon as possible. The person appointed will have opportunity to undertake medico-legal work outside the University, and a suitably qualified candidate may be recommended for appointment to an official position with the Sheffield Police Force. A basic training in pathology is essential. A new salary scale is being introduced and is expected to be £1200–£100–£1900, with F.S.S.U. and family allowance. Initial salary according to qualifications and experience.

Further particulars should be obtained from the Registrar, to whom applications (10 copies) should be sent by 15th June, 1957.

UNIVERSITY OF ABERDEEN. Applications are invited for the post of LECTURER IN BACTERIOLOGY. Salary scale (*b*), at present £1100–£1500, or (*a*) at present £700–£1000; on revision maximum of scale (*b*) may be £1750. F.S.S.U. and children's allowance. Part of removal expenses refunded. Preference to candidates with medical qualifications.

Particulars from the Secretary, The University, Aberdeen, with whom applications (8 copies) should be lodged not later than 15th June, 1957. Applicants outside the British Isles may submit 1 copy.

UNIVERSITY OF ST. ANDREWS. The University Court of the University of St. Andrews invites applications for a LECTURESHIP IN PHYSIOLOGY in Queen's College, Dundee. The primary duty of the Lecturer will be to take charge of the teaching of practical histology to students of medicine, dentistry and science. It is hoped that he will also give lectures on general physiological topics. The Lecturer will be expected to carry out research on physiological or histological problems. Salary scale is—for those with registrable medical qualification—£700–£100–£1200—efficiency bar—and thereafter by £100–£1600; for those with non-medical qualification £650–£50–£1350, with efficiency bar at £1000. The scales however are under review and placing will be on the appropriate scale, as revised, according to qualifications and experience, but at a stage below the efficiency bar. F.S.S.U. and family allowance benefits; a grant towards removal expenses will be made.

Further particulars may be obtained from the undersigned, with whom 6 copies of the application, containing the names of 3 referees, should be lodged not later than 31st May, 1957.

PATRICK CUMMING, Joint Clerk to the University Court.

May, 1957.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Applications are invited for the post of ASSISTANT LECTURER IN PHYSIOLOGY. The present salary scale of £750 rising by £100 to £1050 p.a. is subject to review.

Applications (8 copies), together with the names of not more than 3 referees, should reach the undersigned not later than 8th July, 1957.

E. R. EVANS, Registrar.

Cathays Park, Cardiff, May, 1957.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Applications are invited for the post of ASSISTANT LECTURER IN ANATOMY. The present salary scale of £750 rising by £100 to £1050 p.a. is subject to review.

Applications (8 copies), together with the names of not more than 3 referees, should reach the undersigned not later than 22nd June, 1957.

E. R. EVANS, Registrar.

Cathays Park, Cardiff, May, 1957.

POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Vacancy for Full-time LECTURER (Consultant, Rheumatology) in the Department of Medicine. Salary range : £1900–£2400 (under revision). F.S.S.U.

Applications to the Dean, Postgraduate Medical School, before 31st May.

UNIVERSITY COLLEGE, Ibadan, Nigeria. Applications are invited for the following posts in Clinical Departments :—

Chemical Pathology : 2 LECTURERS.

Surgery : LECTURER IN TRAUMATIC SURGERY AND ORTHOPÆDICS.

Appointments, from October, 1957, for 3 years in first instance. Salary scale : £1700–£100–£2100 p.a. Allowance for up to 3 children, £50 p.a. per child resident in Nigeria, £100 p.a. per child resident elsewhere. Part furnished accommodation at rent not exceeding 7.7% of salary. Passages for appointee, wife and up to 3 children below age of 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60.

Detailed applications (10 copies), naming 3 referees, by 17th June, 1957, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

Hospital Services : Senior Appointments

BROMPTON HOSPITAL, S.W.3. The Hospitals for DISEASES OF THE CHEST. The Board of Governors invites applications for the appointment of Part-time ASSISTANT PHYSICIAN (Consultant) tenable at Brompton Hospital. The appointment involves attendance for 2 notional half-days each week. Candidates are required to be Fellows or Members of the Royal College of Physicians of London.

Applications (9 copies), stating date of birth, qualifications and experience with the names of 3 referees, are to reach the undersigned not later than 15th June, 1957.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

NEASDEN HOSPITAL (Infectious Diseases), Brentfield-road, N.W.10. Locum Tenens ASSISTANT PHYSICIAN (whole-time), Senior Hospital Medical Officer grade, required for above Hospital from 1st to 29th August, 1957, inclusive. Experience in general medicine and infectious diseases. Resident while on duty.

Applications to Physician-Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at West Ham Child Guidance Clinic, Credon Road School, Plaistow, E.13, for 4 sessions a week. This post will be associated with preventive mental health work which is being actively developed through the Borough Maternity and Child Welfare Services in conjunction with the Child Guidance Clinic.

Part-time CONSULTANT PSYCHIATRIST to South Essex Child Guidance Clinic, Whitehall Lodge, Grays, for 2 sessions a week.

Part-time CONSULTANT DERMATOLOGIST to St. Andrew's Hospital, Billericay, Essex, for 1 session a week.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 22nd June.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETIST, King Edward Memorial Hospital, Ealing (145 Beds), with allied hospitals—Perivale Maternity Hospital, Greenford (51 Beds), Clayponds Wing, South Ealing (24 Beds). 3 notional half-days per week—Monday morning, Wednesday morning, plus emergencies. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, before 24th June, 1957.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) in the Department of Pathology (Morbid Anatomy).

Applications (12 copies), together with names of 3 referees, should be sent to the House Governor to reach him not later than 7th June, 1957.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a Full-time or Part-time Locum RADIOTHERAPIST (Consultant, Senior Registrar or Registrar) at the above Hospital for a period of about 3 months beginning 1st June, 1957. Consideration would be given to any applicants who could only act as Locum during August.

Further information can be obtained from the Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton (Tel. No. Brighton 29155), to whom applications for the post should be sent immediately.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Locum RADIOLOGIST required for 8 sessions per week from 8th to 29th September, 1957.

Applications, giving details of experience, with the names of 2 referees, to Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton, 7.

BIRMINGHAM REGIONAL HOSPITAL BOARD. All SAINTS' HOSPITAL, BIRMINGHAM. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer). Opportunity for work in Research Centre in conjunction with Birmingham University. Experience specialty required.

Applications (15 copies), stating name, age, nationality, present and previous appointments, and details of 3 referees, to Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, by 24th June.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Temporary CONSULTANT E.N.T. SURGEON (9 notional half-days weekly). Tenable for approximately 2 years from August, 1957, whilst present Consultant seconded to Colonial appointment. Duties mainly at Hospital of St. Cross, Rugby, and Manor Hospital, Nuneaton. Higher qualification/wide experience specialty required.

Applications (15 copies), stating name, age, nationality, present and previous appointments and details of 3 referees, to Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, by 24th June.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM DOWN, near CANTERBURY. Locum Tenens CONSULTANT PSYCHIATRIST required, either whole-time or part-time, for duties at the above Hospital and peripheral clinics. Salary, according to classification, in accordance with National Health Service rates of remuneration.

Applications should be forwarded to the Physician-Superintendent from whom any further particulars may be obtained.

CHELMSFORD, ESSEX. BROOMFIELD HOSPITAL. Required, experienced Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER for long period, full residence or only when on duty. Unit has 312 Beds for the treatment of pulmonary tuberculosis in adults. Tuberculous and non-tuberculous thoracic surgery, chest clinics, and mass radiography.

Apply Physician-Superintendent.

CROWTHORNE, BERKSHIRE. BROADMOOR INSTITUTION. (920 Beds for persons of unsound mind of criminal tendencies.) Whole-time MEDICAL SUPERINTENDENT (Consultant). Wide experience in psychiatry and the D.P.M. necessary. Post is a clinical one but experience in hospital administration also necessary. House available.

Applications, naming 3 referees, to the Secretary, Board of Control, Div. 1 (3), Ministry of Health Building, Savile-row, London, W.1, by 7th June, 1957. Candidates may visit Institution by appointment with Acting Medical Superintendent.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. BOARD OF GOVERNORS, UNITED CAMBRIDGE HOSPITALS. ASSISTANT PSYCHIATRIST (whole-time). Duties will be predominantly at Fulbourn Hospital with opportunities for Social Therapy and will include work in the Outpatients Department of Addenbrooke's Hospital. A flat is available at Fulbourn Hospital. Salary scale £1653 15s.–£2126 5s.

Applications (12 copies), stating age, experience and names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 3rd June, 1957. Candidates invited to visit the hospitals by direct arrangement with the Medical Superintendent, Fulbourn Hospital, Cambridge.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT IN PÆDIATRICS (8 notional half-days per week) for duties at hospitals in the Dewsbury, Batley and Mirfield Group with additional duties as may be required at hospitals in the Pontefract, Wakefield and Huddersfield and Halifax Areas. Duties also required at the School Clinic, Dewsbury. The person appointed will be required to reside in Dewsbury or within such a distance thereof as may be laid down by the Board.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary to the Board, Park-parade, Harrogate, by 17th June, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ANÆSTHETIST (9 sessions per week) for duties in the Halifax area. The person appointed to reside in Halifax.

Applications (12 copies), stating age, qualifications and details of appointments held, showing dates, with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 17th June, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum appointments for an initial period of 3 months in each case :—

(*a*) ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale), Halifax.

(*b*) ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale), Storthes Hall Hospital, Kirkburton, near Huddersfield.

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Additional maximum Part-time CONSULTANT UROLOGIST with duties in the Urological Departments at Crumpsall and Booth Hall Children's Hospitals, Manchester ; Salford Royal and the Royal Manchester Children's Hospital, Pendlebury ; and the Christie Hospital and Holt Radium Institute, Manchester. Wide experience and higher qualifications essential. Appointee to live near main Hospital.

Application forms, from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 5th June, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer), Burnley and District Hospital Centre, mainly at the Victoria Hospital, Burnley, but including duties at Burnley General and Reedyford Memorial Hospitals. Good experience and higher qualifications required ; appointee to live in or near Burnley.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 10th June, 1957.

OXFORD REGIONAL HOSPITAL BOARD. Locum CONSULTANT RADIOTHERAPIST required for 1 month at Northampton and 1 month at Reading in August/September.

Applications, stating qualifications, experience, and names of 2 referees, to Secretary, 43, Banbury-road, Oxford.

NEWCASTLE REGIONAL HOSPITAL BOARD. Con-SULTANT PSYCHIATRIST (child guidance) for St. Luke's Hospital, Middlesbrough (567 Beds). The Child Guidance Unit has an active Outpatient Department and additional outpatient clinics will be arranged in association with the North Riding Local Authority. An Inpatient Unit of 16 Beds is available. The appointment is whole-time, up to 2 sessions per week may be spent at the Unit of Child Psychiatry, Newcastle, a teaching and research unit associated with the University Department of Psychological Medicine. Opportunities will be given for devoting some time to adult psychiatry. Appointee to reside in close proximity to the Hospital. Further particulars from Regional Psychiatrist.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NORTH GLOUCESTERSHIRE CLINICAL AREA. South-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT E.N.T. SURGEON to the North Gloucestershire Clinical Area. The appointment may be held either on a whole-time or maximum (9 sessions) part-time basis. The successful candidate will have charge of beds at the Gloucestershire Royal Hospital (Southgate Street Unit), Gloucester, and will be required to visit other hospitals in the Clinical Area as determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 15th June, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of CONSULTANT E.N.T. SURGEON (part-time—8 sessions). The appointment will include undergraduate and postgraduate teaching, and will be to the Edinburgh Northern Group of hospitals and the Royal Hospital for Sick Children. In addition the successful candidate will be responsible for outpatient clinics in the Scottish Borders. Further particulars from the Secretary of the South-Eastern Regional Hospital Board.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be sent to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 22nd June.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. General Surgery. ARBROATH INFIRMARY. Applications are invited for the appointment of SURGEON (Consultant) at Arbroath Infirmary (105 Beds—38 for general surgery). The appointment will also involve duties at Stracathro Hospital, Brechin, in the unit under the charge of the whole-time Surgeon there, and participation in clinical teaching at Dundee Royal Infirmary. The appointment will be on a whole-time or maximum part-time basis in the option of the successful candidate. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars may be had from the Secretary to the Board, "Bracknowe," 430, Blacknesss-road, Dundee, with whom applications must be lodged not later than 25th June, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Carlton Hayes Hospital, Narborough, near Leicester. A house is available. Salary £1653 15s.–£52 10s.—£2126 5s.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 22nd June, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for appointment as Part-time CONSULTANT ANÆSTHETIST to the St. Francis and Lady Chichester Group of hospitals for duties at the Neuro-psychiatric Unit at Hurstwood Park, Haywards Heath, Sussex, to cover neurosurgical operating sessions on Tuesdays and Wednesdays (mornings and afternoons) together with emergencies. Either 1 or more appointments within a total of 6 notional half-days a week may be made. Candidates must be experienced Anæsthetists, preferably with training and practice in anæsthetics for neurosurgery, and hold the appropriate qualifications. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications, experience and number of notional half-days for which available, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 8th June, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. Whole-time Locum Tenens ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) required for the Winchester Group of hospitals for approximately 3 months from 30th June, 1957. The successful applicant will be required to undertake routine clinical pathological work at the Royal Hampshire County Hospital, Winchester, and will make occasional visits to associated hospitals in the Group.

Applications, stating age, qualifications and the names and addresses of 3 referees, the Area Secretary, Highcroft, Romsey-road, Winchester, by 12th June, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD requires Whole-time or maximum Part-time CONSULTANT RADIOTHERAPIST at St. Luke's Hospital, Guildford, Surrey. Candidates must have D.M.R.T. and wide experience in radiotherapy. The successful candidate will be required to live within reasonable distance of Guildford.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 15th June, 1957. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. WARLINGHAM PARK HOSPITAL, WARLINGHAM, SURREY. Vacancy for Locum SENIOR HOSPITAL MEDICAL OFFICER for a period of 18 weeks commencing 1st August, 1957, at the Croydon Child Guidance Clinic. Candidates should have had experience in child psychiatry.

Applications as soon as possible to the Acting Medical Superintendent, Warlingham Park Hospital.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Part-time MEDICAL SUPERINTENDENT to the Chard and District Hospital (Chronic Sick Section), 46 Beds. The successful applicant will be required to make periodical visits to the Hospital totalling approximately 3½ hours per week. Salary £183 15s. p.a. and conditions of service in accordance with those laid down by the Whitley Council for hospital medical and dental staffs.

Applications, giving names of 2 referees, to the Group Secretary, Taunton and Somerset Hospital (Musgrove Park Branch), by 15th June, 1957.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens CONSULTANT (General Surgery) required Aberystwyth General Hospital immediately for approximately 1 month.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer), Caernarvon and Anglesey and Clwyd and Deeside Hospital Management Committee areas. To assist Group Consultants in Hospitals and conduct School Ophthalmic Clinics in both areas. Based in Llandudno area.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

DUBLIN. ST. LAURENCE'S HOSPITAL (Richmond). DIRECTOR OF RADIOLOGY. The Board of Governors invite applications for a Radiologist to take charge of Hospital Department. Minimum of 9 three-hourly sessions a week required. Remuneration in accordance with Health Act sessional rates, plus a proportion of private fees.

Further particulars from Secretary, to whom applications should be forwarded on or before 30th June, 1957.

DUBLIN. ROYAL CITY OF DUBLIN HOSPITAL AND DR. STEEVENS' HOSPITAL. A joint appointment of a PATHOLOGIST is to be made by the Governors of the Royal City of Dublin Hospital, the Governors of Dr. Steevens' Hospital and the Board of Trinity College, Dublin. The total salary will be £1800. The Pathologist appointed will act as Pathologist to the Royal City of Dublin Hospital and Dr. Steevens' Hospital. He will be responsible for teaching duties to be carried out in the hospitals on behalf of Trinity College.

Further details may be had from the undersigned to whom applications should be sent before 20th June, 1957.

Dr. Steevens' Hospital. WILLIAM KENNEDY, Secretary.

U.S.A. VIRGINIA. Applications are invited for the following appointments :—

(*a*) MENTAL HOSPITAL CHIEF OF SERVICE. Salary $10,992–$12,528 (£3925–£4474). Minimum qualification is 4 years of psychiatric experience including 2 years of mental hospital psychiatry. The appointee will be responsible for the overall supervision of either the men's or women's psychiatric division of the Hospital and should be interested in assisting with the training of Junior Physicians. A higher qualification is desirable.

(*b*) MENTAL HOSPITAL STAFF PHYSICIANS. Salary $10,032–$11,472 (£3583–£4097). Applicants must have at least 2 years of psychiatric experience and be experienced in modern methods of treatment. The duties will principally be concerned with patient care but the Staff Physicians are expected to assist in the supervision of the Junior Physicians.

(*c*) MENTAL HOSPITAL JUNIOR PHYSICIANS. Salary $8400–$9168 ($3000–£3274). These appointments are approved by the American Medical Association for 2 years training in psychiatry. The Junior Physicians work under the supervision of the senior staff members and are required to attend all training sessions as planned by the Director of Training and Research.

Eastern State Hospital is a 2100-Bed mental hospital operated by the Commonwealth of Virginia. It is situated in historic Colonial Williamsburg, is within easy reach of Richmond, Virginia, and Washington, D.C. Mentally ill patients of the white race are accepted for treatment. Mental defectives and epileptics are not eligible for admission unless their illness is complicated by psychosis.

Applicants should send full details of their training and experience together with the names and addresses of 3 referees to the undersigned by air-mail. Suitable applicants may be interviewed in London between 18th and 21st July.

JOSEPH E. BARRETT, M.D., Superintendent.
Eastern State Hospital, Williamsburg, Virginia, U.S.A.

NEW ZEALAND. TIMARU PUBLIC HOSPITAL, South CANTERBURY, NEW ZEALAND. Applications, addressed to the undersigned, are invited for the post of E.N.T. SURGEON, which is a part-time appointment. Salary is governed by the Hospital Employment Regulations, and would vary, according to qualifications and experience, between £480 and £765 (N.Z. currency) p.a. The appointee would establish himself in private practice without financial obligation. First-class private hospital facilities are available in the town. Further particulars obtainable from the Medical Superintendent.

Applicants to state age, married or single, qualifications and experience and to enclose not more than 3 copies only of recent testimonials. H. G. NAYLOR, Secretary,

The South Canterbury Hospital Board.
P.O. Box 88, Timaru, New Zealand.

NEW ZEALAND. PALMERSTON NORTH HOSPITAL BOARD, PALMERSTON NORTH, NEW ZEALAND. Applications are invited from registered medical practitioners for the position of Full-time RADIOLOGIST in charge of the X-ray Diagnostic Department at the Palmerston North Hospital, New Zealand. Applicants must have had practical experience in diagnostic radiology and should hold a higher qualification in this specialty in order to qualify either as a Senior or as a Junior Specialist under the Hospital Employment (Medical Officers) Regulations, 1957. Salary :

Senior Specialist £N.Z.2040–£N.Z.2340 p.a.

Junior Specialist £N.Z.1640–£N.Z.1940 p.a.

Conditions of appointment are obtainable from the Offices of the New Zealand Government, 415, Strand, London, W.C.2.

Applications, giving full particulars as to age, qualifications and experience and accompanied by recent testimonials and advice as to the earliest date on which appointment could be taken up, to be addressed to the Secretary, Palmerston North Hospital Board, P.O. Box 607, Palmerston North, New Zealand. Applications will be received until NOON on Monday, 1st July, 1957. R. S. WILSON, Secretary.

U.S.A. VIRGINIA. Progressive State mental hospital in Virginia, 4600 Beds, expanding staff, invites applications for PHYSICIANS at all levels, psychiatric experience desirable but not necessary. Salary from $8040 (approximately £2750). All modern methods of treatments. Opportunities for research. Good retirement plan.

Apply to JUUL C. NIELSEN, M.D., Superintendent, sending full résumé in first letter to Box 271, Petersburg, Virginia, U.S.A.

Hospital Services : Junior Appointments

ALBERT DOCK ORTHOPÆDIC AND FRACTURE HOSPITAL, Alnwick-road, E.16. SEAMEN'S HOSPITALS GROUP. SENIOR HOUSE OFFICER (surgery) required on or about 1st July. Post, which is normally resident, is recognised by the Royal College of Surgeons, and provides excellent experience in a wide variety of traumatic conditions received from the adjacent dockland and from shipping in the Port of London. Salary £819 10s.

Applications, stating age, nationality, qualifications, and experience with the names of 2 recent referees, should be sent to the Secretary, Dreadnought Seamen's Hospital, Greenwich, not later than 1st June.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER. Residence optional. House Officer or Senior House Officer grade according to experience. Vacant immediately. Not recognised for F.R.C.S.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts :—

NON-RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience), for 6 months from 1st August, 1957, with eligibility for reappointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN (2 vacancies). 1 vacancy for 6 months from 1st August, 1957. Duties include work in Outpatient Department and wards. 1 vacancy for 9 months from 1st August, 1957. The first 3 months at Brompton Hospital Sanatorium, Frimley, and the following 6 months at the Hospital in London covering work in Outpatient Department and wards. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 8th June, 1957, to—

KENNETH A. F. MILES, House Governor.

CAMBERWELL HOSPITALS MANAGEMENT COM-MITTEE. Applications invited for appointment to the undermentioned posts :—

(1) **At Dulwich Hospital** (in association with King's College Hospital Medical School for teaching purposes), **East Dulwich-grove, S.E.22**

HOUSE OFFICER (general medical duties)—3 positions.
HOUSE OFFICER (general surgical duties)—3 positions.

(2) **At St. Giles' Hospital, Camberwell, S.E.5**

HOUSE OFFICER (general medical duties)—1 position.
HOUSE OFFICER (general surgical duties)—1 position.
HOUSE OFFICER (orthopædic duties)—1 position.

All posts vacant on 1st July, 1957, and recognised for pre-registration purposes.

Applications, giving age, qualifications and details of previous posts (if any), with copy testimonials or names of 2 referees, to be sent to the Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 1st June, 1957.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER (resident) required in Anæsthetic Department. Whole-time appointment for 6 months. Renewable. Post vacant. Previous experience in anæsthesia essential. Post recognised for the D.A. and F.F.A.R.C.S.

Applications, with copies of 2 testimonials or names of 2 referees, to Medical Director by 8th June.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £819 10s. p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited for the 6 months resident appointment, vacant 8th June, of registered HOUSE PHYSICIAN and should be sent as soon as possible to the Group Secretary, Hackney Hospital, E.9, quoting GH/HP.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited for the 12 months resident appointment, from 2nd June, of SENIOR CASUALTY OFFICER (Senior House Officer grade) and should reach the Group Secretary, Hackney Hospital, E.9, as soon as possible.

HACKNEY GROUP HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for the 12 months resident appointment of SENIOR HOUSE OFFICER (anæsthetics), now vacant. Duties shared between German Hospital, E.8 (157 Beds—General), and The Mothers' Hospital (Salvation Army), E.5 (110 Beds—Maternity), with residence at the German Hospital. The post offers experience in general surgical anæsthesia and is approved for the Diploma in Anæsthetics. Facilities for study provided.

Apply Group Secretary, Hackney Hospital, London, E.9, quoting GH/SHO, by 1st June.

HACKNEY HOSPITAL, London, E.9. (General—341 Beds.) Applications for the 6-months resident appointment from 18th June of Pre-registration HOUSE PHYSICIAN (first post), should be sent to Secretary, above address, by 31st May, quoting HH/PHP.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Locum Wholetime REGISTRAR (orthopædics) required for several weeks commencing immediately. Salary £19 5s. per week.

Detailed applications immediately to Secretary, Board of Governors.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. 2 RESIDENT HOUSE SURGEONS (radiotherapy) required. 1 1st July, 1 23rd July. These 2 posts offer opportunities for attending general surgical postgraduate teaching.

Applications, stating qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 3rd June.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £819 10s. p.a., Vacant 1st July, 1957, tenable for a period of 6 months at the Main Outpatients Department, Bayham-street, N.W.1.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1957.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the pre-registration post of NON-RESIDENT CASUALTY OFFICER (medical or surgical), vacant 1st July, 1957, tenable for a period of 6 months.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 30th May, 1957.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. HOUSE SURGEON, vacant 17th June. 50 surgical beds, new operating theatre, Outpatient and Casualty Departments. Preference given to applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE PHYSICIAN, to become vacant on Tuesday, 2nd July, 1957. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Monday, 3rd June, 1957, together with copies of 3 recent testimonials.

KING'S COLLEGE HOSPITAL BOARD OF GOVERN-ORS, Denmark Hill, S.E.5, AND THE SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Radiology (Diagnostic), to be made jointly by the bodies concerned, the post to be held at King's College Hospital and in the Woolwich Hospital Group. Applicants should hold a higher qualification in radiology and the possession of either M.D. or M.R.C.P. is desirable. The successful candidate will be expected to spend part of his time in the Regional Board Hospital on an exchange basis. The appointment, which is renewable annually, will be tenable for a 4-year period, commencing 1st October, 1957, but the successful applicant will be expected to take up his duties on 1st July, 1957.

Applications, stating age, education and qualifications and experience, and giving the names of 2 referees, should be sent to the undersigned not later than 1st June, 1957.

S. W. BARNES, House Governor.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st August, 1957, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic, as well as in wards.

Applications, stating date of birth, qualifications, with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 17th June.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL, E.2. Hospitals for Dis-EASES OF THE CHEST. Applications are invited for the post of REGISTRAR in Anæsthetics (recognised for F.F.A.R.C.S.). The post is a whole-time one, non-resident and tenable in the first instance for 1 year. Duties include attendance at the Country Branch, near Letchworth, Herts.

Applications, stating date of birth, qualifications with dates, previous appointments held, and accompanied by copies of 3 testimonials, should reach the undersigned by 29th May, 1957.

London, E.2. THOMAS BROWN, House Governor.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st August, 1957, for RESIDENT SURGICAL OFFICER (grading: Registrar) at the Hospital's Country Branch, near Letchworth. There are 207 Beds, mainly surgical, and candidates should be experienced in thoracic surgery. Appointment for 6 months, with the prospect of renewal.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 17th June.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE PHYSICIAN (pre- or post-registration) required for 6 months.

Applications, stating age, experience, &c., and enclosing copies of testimonials, to be sent to the Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE PHYSICIAN, vacant 1st July, 1957. Successful candidate will be expected to carry out fortnight's locum duty from 17th June, 1957.

Application form from the Acting Physician-Superintendent. A stamped addressed envelope should be enclosed.

LAMBETH HOSPITAL, Brook-drive, S.E.11. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required. Appointment is for 2 years subject to review after 12 months. Recognised for D.A. and F.F.A.R.C.S. Candidates may visit the Hospital by appointment if they so desire.

Application forms from the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed forms should be returned not later than 1st June, 1957.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE SURGEON in the Obstetric and Gynæcological Unit. Appointment for 6 months from 1st July, 1957. It would be a convenience, but not a necessity, if the successful candidate could carry out a fortnight's Locum duty starting from 17th June, 1957. The Hospital is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G.

Application form from the Physician-Superintendent; stamped addressed envelope should be enclosed.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (Anæsthetist). The post is recognised for the F.F.A.R.C.S.

Apply, stating age, nationality, qualifications and experience, together with 2 testimonials, to the Hospital Secretary.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1 (with which is associated the Institute of Cardiology). Applications are invited for the post of ASSISTANT RESIDENT MEDICAL OFFICER (Male). The appointment is for a period of 6 months from 1st July, 1957, but may be renewed for a further period of 6 months. The status and salary are those of a Senior House Officer and are in accordance with the national terms and conditions of service.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Friday, 7th June, 1957.

ROBERT G. E. WHITNEY, Secretary to the Board.

NORTH MIDDLESEX HOSPITAL AND EDMONTON CHEST CLINIC, London, N.18. SENIOR HOUSE OFFICER (tuberculosis), resident, required, for 1st July. Appointment for 6 months in the first instance with possible extension to 1 year. Duties at above Hospital and Clinic under the direction of the Chest Physician. Further details on request.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 3rd June.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT SENIOR CASUALTY OFFICER, recognised for F.R.C.S. examination, to the above Hospital for a period of 6 months, vacant 1st July, 1957.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 8th June, 1957.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. Applications are invited for the post of RESIDENT SENIOR HOUSE PHYSICIAN for 6 months. Opportunity to serve for a further 6 months as Obstetric/Gynæcological House Surgeon in same grade.

Applications, with 3 testimonials, to House Governor, not later than 30th May, 1957.

PUTNEY HOSPITAL, Lower Common, S.W.15. House PHYSICIAN (resident) Male or Female, with some gynæcological duties. Vacant 1st July, 1957. Open to pre-registration candidates.

Apply Hospital Secretary not later than 5th June, 1957, enclosing copies of 3 recent testimonials.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 1st July, 1957, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor without delay.

QUEEN MARY'S (ROEHAMPTON) HOSPITAL, London, S.W.15. (386 Beds.) ORTHOPÆDIC REGISTRAR required, whole-time. National Health Service terms and conditions.

Applications (4 copies), giving nationality, date of birth, qualifications and experience, present appointments, and names of 3 referees, should reach the Secretary, Ministry of Health, Division 4 (v), Norcross, Blackpool, Lancashire, by 14th June, 1957.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the Gynæcological and Obstetric Department. The post is full-time, and recognised under the Senior Registrar establishment. Resident on alternate weeks, duties to commence 1st August, 1957. Candidates should be members of the Royal College of Obstetricians and Gynæcologists.

Applications, together with the names of 3 referees, should be sent to the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 22nd June, 1957.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in General Medicine to the Departments of Neurology, Psychiatry and Physical Medicine at the Royal Free Hospital. The appointment is full-time, resident, for 6 months in the first instance. Duties to commence 1st July, 1957. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 8th June, 1957.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics), vacant 8th July, 1957. Occasional casualty duties. Recognised for F.R.C.S.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary by 1st June, 1957.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) to above Hospital for duty in the Infectious Diseases Unit and other general duties, for a period of 6 months from 4th August, 1957.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 8th June, 1957.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (third post) to above Hospital for a period of 6 months. Vacant immediately.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Medicine to be held for 2 years at St. Bartholomew's Hospital; a third year at either Chase Farm Hospital, Enfield, or King George Hospital, Ilford, and for a fourth year by arrangement. The appointment is tenable in July, 1957, and is subject to annual re-election.

Applications (10 copies), together with names of 3 referees, should be submitted to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, E.C.1.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of REGISTRAR to the Fever Unit at the Grove Hospital, Tooting, S.W.17. A good knowledge of general medicine is required, but experience of infectious diseases and possession of the Diploma of M.R.C.P. are not essential. The appointment is for 1 year in the first instance, and the successful candidate will be required to take up duty as soon as possible.

Applications, stating age, education, qualifications, experience and the names of 2 referees, should reach the undersigned not later than 5th June, 1957.

P. H. CONSTABLE, House Governor.

ST. JAMES' HOSPITAL, Balham, S.W.12. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Part-time REGISTRAR, 7 sessions per week, for Ophthalmic Unit (18–20 Beds and outpatient clinics). Resident or non-resident. Post vacant now.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, at above address, to be completed and returned as soon as possible. (0318.)

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum REGISTRAR (obstetrics and gynæcology) required from 3rd to 30th June.

Apply, with full particulars, including names of 2 referees, to Group Secretary at above address. (0320.)

ST. JAMES' HOSPITAL, Balham, S.W.12. House Officer for gynæcology and antenatal clinics required immediately. Obstetric appointment will be available in 2–3 months.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address. (0319.)

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT (graded Senior House Officer)—2 vacancies, each for 3 notional half-days per week. These appointments are designed for Men or Women who have already passed their Primary F.R.C.S., and is ideally suited for those reading for the Final, as a large number of clinical cases are available; they will be for a first period of 12 months as from a date to be arranged.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 10th June, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified registered practitioners for the post of RESIDENT ANÆSTHETIST. The appointment is for a first period of 6 months. The successful candidate will be required to take up his duties on 1st July, 1957; remuneration to be at Senior House Officer rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 10th June, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from registered practitioners for the post of HOUSE OFFICER in the Almroth Wright Wards, graded Senior House Officer. The appointment is for a period of 8 months, with effect from 1st August, 1957.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 12th June, 1957.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, London, E.13. HOUSE SURGEON (pre-registration first or second post) to commence 8th June, 1957.

Apply to Hospital Secretary by 31st May, 1957.

ST. LEONARD'S HOSPITAL, Nuttall-street, N.1. (Acute general—192 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The appointment is for 12 months.

Applications, with 2 testimonials, to the Hospital Secretary by 1st June, 1957.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. Applications are invited from registered or provisionally registered medical practitioners for the posts of HOUSE PHYSICIAN for 6 months, commencing 6th June, 1957, HOUSE SURGEON for 6 months commencing 19th June, 1957.

Applications, with 2 recent testimonials, to the Hospital Secretary by 1st June, 1957.

ST. THOMAS'S HOSPITAL AND THE SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Obstetrics and Gynæcology at St. Thomas's Hospital and Lambeth Hospital for a period of 1 year in the first instance. The successful candidate will be required to take part in undergraduate teaching.

Applications (6 copies), naming 3 referees, to the Clerk of the Governors, St. Thomas's Hospital, London, S.E.1, by 31st May, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident ASSISTANT SURGEON (Senior Registrar grade) for a period of 1 year in the first instance from 1st December, 1957. Renewable for a second year.

Applications, naming 2 referees, to the Clerk of the Governors by 31st May, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 8th June, 1957.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. (X-RAY DIAGNOSTIC DEPARTMENT.) Applications are invited for the post of D.M.R. TRAINEE (graded Registrar or Senior House Officer, according to experience), vacant 1st July, 1957. Preference will be given to applicants holding a higher medical or surgical qualification.

Applications, with names of 2 referees, to Administrator and Secretary by 8th June, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the vacant post of SENIOR HOUSE OFFICER in the E.N.T. Department.

Application forms obtainable from the Hospital Secretary to be returned by 3rd June, 1957.

WHITTINGTON HOSPITAL, London, N.19. Applications are invited for the following appointments:—

*HOUSE PHYSICIAN (general medicine). 4 posts recognised for M.D. (Lond.).

HOUSE PHYSICIAN (post-registration), neurosurgical. Recognised for M.D. (Lond.).

†HOUSE SURGEON (general surgery). 3 posts recognised for F.R.C.S. (Eng.).

HOUSE SURGEON (obstetrics). Post recognised for M.R.C.O.G. in obstetrics.

*HOUSE PHYSICIAN (pædiatrics). Post recognised for M.D. (Lond.) and D.C.H.

All posts vacant 1st July, 1957.

*Pre-registration candidates who have already held a first appointment may apply.

†Pre-registration candidates may apply.

Application forms obtainable from Group Secretary, 46, Cholmeley-park, London, N.6 (ARChway 3070, Ext. 527) and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 3rd June, 1957.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of Locum Tenens SENIOR SURGICAL REGISTRAR for 6 months from 1st July, 1957. Candidates must be F.R.C.S.

Applications (12 copies), with names of 2 referees, to House Governor by 4th June.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of RESEARCH ASSISTANT (Registrar grade) to Radiotherapy Department (Megavoltage Units) for 1 year in first instance. Post vacant now. Previous experience in radiotherapy an advantage. Facilities will be given to study for higher qualification.

Applications (7 copies), with names of 2 referees, to House Governor by 8th June.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON vacant 23rd June, 1957. The appointment is recognised for the D.Obst.R.C.O.G.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee Forest Group, Langthorne-road, E.11.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS. 4 posts vacant 1st July. 2 at Memorial Hospital, Woolwich, and 2 at St. Nicholas Hospital, Plumstead. All recognised for F.R.C.S. and approved for pre-registration purposes.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIANS. 5 posts vacant early July, 3 at Brook General Hospital, Woolwich, 2 at St. Nicholas Hospital, Plumstead. All posts approved for Pre-registration Service.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18, not later than 1st June.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. ABERDEEN ROYAL INFIRMARY AND WOODEND GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics. The post, which is non-resident, is subject to the conditions of service issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, and the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days from the appearance of this advertisement.

ABERDEEN MENTAL HOSPITALS.

(1) **Aberdeen Royal Mental Hospital, Aberdeen**
(2) **Kingseat Mental Hospital, Newmachar, Aberdeenshire**

The undernoted medical staff required for the above Hospitals where all forms of modern treatment are undertaken and where there is association with the University Department of Mental Health.

SENIOR HOUSE OFFICERS. Salary £819 10s. p.a., less £150 if resident.

HOUSE OFFICERS (fully registered). Salary £577 10s. p.a., less £125 if resident.

The hospitals are separate entities and applications, giving full details of age, &c., are to be made to the respective Physician-Superintendent. Applications for Locum appointments will be considered.

ACCRINGTON. VICTORIA HOSPITAL. Blackburn and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for 5th July, 1957. Recognised for pre-registration purposes.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (medical), vacant August, 1957.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the pre-registration post of JUNIOR HOUSE OFFICER (surgical), vacant July, 1957.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

ALTRINCHAM GENERAL HOSPITAL. Annexe and E.N.T. DEPARTMENT. (183 Beds.) SENIOR HOUSE OFFICER (surgical). This appointment affords excellent experience to suitably qualified candidates. Post recognised under F.R.C.S. regulations.

Applications, with names of 2 referees, to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required:—

(1) RESIDENT HOUSE SURGEON for general surgical duties.

(2) RESIDENT HOUSE SURGEON for Traumatic and Orthopædic Unit. 6 months appointment, suitable for pre-registration candidate.

Applications, stating age, qualifications and experience with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. Accident and Orthopædic and Children's General Surgery. HOUSE OFFICER or SENIOR HOUSE OFFICER. Grade according to experience. Pre-registration post but registered practitioners invited to apply. Recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOSPITAL. OPHTHALMIC HOUSE OFFICER required, late June. Post recognised for D.O.

Apply, with copies of 2 testimonials, to Secretary-Superintendent.

BARNSLEY. BECKETT HOSPITAL. (174 Beds. Recognised for the F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (anæsthetics) required with duties also at St. Helen Hospital, Barnsley (225 Beds). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 3rd June, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (819 Beds.) CENTRAL WIRRAL GROUP. JUNIOR HOSPITAL MEDICAL OFFICER (casualty/orthopædics) or LOCUM (resident). Salary in accordance with current terms and conditions of service—i.e., £852 10s.–£55–£1182 10s. p.a., less £170 p.a. for residential facilities.

Application forms, obtainable from Group Secretary, to be returned by 8th June, 1957.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required beginning June. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford, by 28th May.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident), vacant June. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of casualty by R.C.S. (Eng.). Teaching programme by Consultant staff. 6-month appointment, some of which may be spent in 42-bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator by 7th June, 1957.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. RESIDENT ANÆSTHETIST (Senior House Officer), vacant 17th June, 1957. There are 3 Consultant Anæsthetists and training is given in modern methods of anæsthesia. Ample opportunity for study. Previous experience not essential.

Applications, with full details naming 2 referees, to Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer grade). The appointment is tenable for 1 year. Candidates must be registered medical practitioners and have held a resident appointment.

Forms of application may be obtained from, and should be returned as soon as possible to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of CLINICAL PATHOLOGIST (Senior House Officer) in the Department of Clinical Pathology. This officer will act as 1 of 4 blood-bank officers in addition to routine work in the department, and will be required to undertake his/her turn in residential duties. Previous experience in clinical pathology is not essential but applicants should have had hospital postgraduate experience. The appointment is tenable for 1 year.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

(*a*) REGISTRAR (pathology) for Coventry Group Laboratory. Recognised D.Path. Experience specialty essential. Wide experience available. Vacant August. Non-resident.

(*b*) REGISTRAR (infectious diseases and general medicine) for Whitley Hospital (153 Beds) (62 and 24 Beds) including Respiratory Paralysis Unit and emergency duties in skin and chest wards. Liaison with Psdiatric Department. Flat available.

(2) **Wolverhampton Group, The Royal Hospital, Wolverhampton**

REGISTRAR (pathology). Duties in all branches of clinical pathology centred on the Royal Hospital. Resident or partly resident. Experience in specialty an advantage.

(3) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

(*a*) REGISTRAR (surgical) for City General Hospital (845 Beds). Whole-time. No casualty work; recognised for F.R.C.S. Work includes genito-urinary, thoracic and cardiac in addition to general surgery.

(*b*) MEDICAL REGISTRAR (chest diseases). Duties mainly at Cheshire Joint Sanatorium (305 Beds) with periods of transfer to Tuberculosis Unit (Pregnancy and Diabetic) at City General Hospital and Stoke-on-Trent Chest Clinic. The post offers wide experience in the investigation and medical and surgical treatment of tuberculosis and other chest diseases. Possible married accommodation available later.

(4) **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

REGISTRAR (obstetrics and gynæcology). Royal Salop Infirmary/Copthorne Hospital. Considerable clinical responsibility. House Surgeon posts (only) recognised for M.R.C.O.G.

(5) **Selly Oak Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (radiology). Duties with Selly Oak Hospital (1059 Beds) and associated Maternity, Eye, E.N.T. and Infectious Diseases Hospitals. All forms of radio-diagnostic work undertaken. Hospital recognised for Part II D.M.R.(D.). Diploma in Radiology desirable but consideration given to holders of Part I only.

Application forms from Group Secretaries to be returned by 3rd June, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens REGISTRAR in Anæsthetics from July to September. Duties mainly at Dudley Road Hospital, Birmingham. Salary £19 5s. per week.

Apply Secretary, 10, Augustus-road, Birmingham, 15, naming 2 referees.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. SENIOR HOUSE OFFICER and HOUSE OFFICER (including pre-registration) required according to experience.

Apply to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. ALL SAINTS' HOSPITAL. Registrar (psychiatry) for All Saints' Hospital (1385 Beds) and Early Treatment Centre, Uffculme. Hospital associated with Birmingham University for teaching and research. Candidates should be actively interested in research. Resident post; married accommodation available.

Applications to the Medical Superintendent.

BIRMINGHAM, 18. ALL SAINTS' HOSPITAL. Senior HOUSE OFFICER (Male or Female), resident. The Hospital is associated with Birmingham University for teaching of psychiatry. Training for Diploma in Psychological Medicine provided.

Applications, stating age and qualifications, to the Medical Superintendent.

BLACKBURN. QUEEN'S PARK HOSPITAL. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics and gynæcology) required for busy unit of 58 Beds taking normal and abnormal cases. Post vacant 27th June, 1957. Recognised for D.Obst.R.C.O.G.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL VICTORIA HOSPITAL. (Acute General Hospital—353 Beds.) CASUALTY OFFICER (Junior Hospital Medical Officer status). Post vacant at end of June. Salary £852 10s.–£55–£1182 10s. p.a. Residence optional. Tenure of post 4 years. Recognised for F.R.C.S. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, experience, qualifications and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (607 Beds including 107 for obstetrics and 30 for gynæcology.) RESIDENT SENIOR HOUSE OFFICER for Department of Obstetrics and Gynæcology. Tenable for 12 months. Hospital recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET GROUP OF HOSPITALS. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Anæsthetics for the above Group with duties including the Christchurch Hospital. This is a new post which is consequent upon the opening of 56 surgical beds at Christchurch Hospital. The post is tenable for 1 year in the first instance and applicants should have had considerable experience in anæsthesia. It will be an advantage if the successful candidate is willing to be resident at 1 of the hospitals.

Forms of application are obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, and should be returned to him within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology at the above Hospital (494 Beds including 36 Obstetrical and 22 gynæcological beds). The post, which is resident, is subject to review after 1 year and is recognised for the M.R.C.O.G.

Forms of application are obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, and should be returned to him duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). The post, which is now vacant, is recognised for the D.A. and F.F.A.R.C.S., and is normally tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON to the Senior Consultant Surgeon. The post, which is now vacant, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident), orthopædics and casualty combined. The post, which becomes vacant on 17th June, is recognised for the F.R.C.S. examination. The Unit consists of Registrar and 2 Senior House Officers with an additional Senior House Officer during the summer months.

Applications to the Hospital Secretary.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Unit. Salary in accordance with national scale. Vacant 24th June, 1957. This post is recognised as a pre-registration appointment.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics). Recognised for F.R.C.S. examinations. Salary in accordance with national scale.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7, as soon as possible.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 staffed beds—expanding.) SENIOR HOUSE OFFICER (Regional Department of Neurosurgery). Vacancy occurs about mid-June for the above post, tenable for 6–12 months. The post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." 2 referees required.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (423 Beds.) HOUSE OFFICER in Obstetrics and Gynæcology required. 38 maternity, 18 gynæcological beds. Post vacant now. Recognised for D.Obst.R.C.O.G. and for M.R.C.O.G. in gynæcology and obstetrics.

Applications, with the names of 3 referees, to the Hospital Secretary.

BURTON GENERAL HOSPITAL AND ANDRESSEY HOSPITAL, BURTON UPON TRENT. HOUSE SURGEON (gynæcological and obstetrics) required at above Hospital as from 1st July, 1957. Post recognised for pre-registration purposes.

Apply Group Secretary.

BURTON-ON-TRENT GENERAL HOSPITAL. RESIDENT SENIOR HOUSE OFFICER ANÆSTHETIST required at the above Hospital.

Applications to Group Secretary, General Hospital, Burton-on-Trent, as soon as possible.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics to the above Group. The successful applicant will be based at Bury General Hospital. The post is recognised for the Diploma in Anæsthetics.

Apply, stating full details of age, experience, and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post vacant end of June, 1957. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the post of REGISTRAR in Anæsthetics to commence duty as soon as possible. The successful candidate will work as a member of the Department of Anæsthetics, partly in the Teaching Hospitals and partly in other hospitals in the area. Duties may include undergraduate teaching and assisting with research.

Application forms available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and these should be returned within 14 days of the appearance of this advertisement.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (post approved for Pre-registration Service). General surgery with duties in genito-urinary. Vacant mid-June.

Applications, giving age, qualifications, &c., with copies of recent testimonials and the names of referees, should be sent to Secretary, at above address.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. Locum ANÆSTHETIC REGISTRAR required from 26th May to 8th June, 1957, inclusive.

Apply to the Group Secretary, Wallington 6635, Extension 18.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL, HIGHTOWN, CASTLEFORD. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required. Married accommodation available. Post vacant 1st June, 1957.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer (intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and Pre-registration Service. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Intern) required from 16th May, 1957. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHEPSTOW, MONMOUTHSHIRE. ST. LAWRENCE HOSPITAL. (127 plastic surgery, 50 orthopædic beds.) PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery required about 1st June. There are 2 residents in plastic surgery and 1 in orthopædics. Post tenable 6 or 12 months as desired, and candidates experienced in another specialty wishing to gain plastic surgery experience will be considered. Salary £819 10s. less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for either provisionally or fully registered practitioners. Post approved for pre-registration practitioners, and F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant 1st June.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester, Essex (185 Beds)

Post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for F.F.A.R.C.S. and D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.

Post of SENIOR HOUSE OFFICER (casualty and radiotherapy). Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of REGISTRAR (temporary). Required as Resident Casualty Officer during summer for period not exceeding 6 months.

Harwich and District Hospital, Dovercourt, Essex (30 Beds)

Post of SENIOR HOUSE OFFICER (temporary), required during summer months from June to September. Duties include medical, surgical and casualty work.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COVENTRY AND WARWICKSHIRE HOSPITAL, COVENTRY. SENIOR ASSISTANT (Junior Hospital Medical Officer grade), for orthopædic and accident wards. Appointment for 1 year in first instance, renewable annually up to 4 years. Recognised F.R.C.S. Previous experience desirable.

Applications to Hospital Secretary.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—Acute, and Continuation 32 Beds.) SENIOR HOUSE OFFICER (Orthopædic and Casualty Department). Modern department about to open. Main duties in Casualty Section. Whitley Council salary and conditions of service.

Applications, stating age, qualifications, &c., with names of 2 referees, to be sent as soon as possible to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR CASUALTY OFFICER (Registrar status). Post vacant 22nd July, 1957. Busy department. Post recognised for Final F.R.C.S. examination. The Hospital may be visited on application to Hospital Secretary.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, Croydon General Hospital, London-road, Croydon.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer) resident. Post vacant now. Recognised for Final F.R.C.S. examination. There is a Registrar in charge of Department.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration) required as from 2nd June, 1957. Post recognised for F.R.C.S.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, Surrey.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration) required as from 15th June, 1957.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, Surrey.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR, vacant 1st July. Post recognised for F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 7 days from the publication of this advertisement.

CROYDON. QUEEN'S HOSPITAL. (450 Beds.) Geriatric UNIT. CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident). Post vacant now.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 14 days.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE PHYSICIAN (pre-registration) or SENIOR HOUSE OFFICER (general medicine), vacant mid-July.

Apply, stating full details with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery), vacant early July. Post recognised for F.R.C.S. if held by Senior House Officer.

Apply, stating full details with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (ophthalmology), vacant 1st June. Recognised for F.R.C.S. (Ophthalmology).

Apply immediately, stating full details and 2 names for reference, to Secretary.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) SENIOR HOUSE OFFICER required, vacant 8th July, 1957. Recognised for D.C.H.

Applications, stating full particulars together with copies of 2 recent testimonials, to be sent as soon as possible to Hospital Secretary.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER required, vacant 15th June, 1957. Recognised for D.C.H.

Applications, stating full particulars together with copies of 2 recent testimonials, to be sent as soon as possible to Hospital Secretary.

DERBY. THE PASTURES HOSPITAL, Mickleover, DERBY. (Hospital for mental and nervous disorders.) DERBY NO. 3 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required. Salary £852 10s. rising by £55 p.a. to £1182 10s. The Hospital is near to General Hospitals and facilities for obtaining D.P.M. and Membership training are available. Large outpatient system. House available to married person at a reasonable rent. The Hospital is pleasantly situated about 4 miles from the centre of Derby.

Applications, stating qualifications and experience and giving the names of 2 referees, to be sent immediately to the Group Secretary.

DONCASTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department. The post is recognised under the Fellowship regulations.

Applications to the Group Secretary, Doncaster Hospital Management Committee at Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST in the grade of Senior House Officer. Post recognised under the regulations for the F.F.A.R.C.S. and D.A.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) SENIOR HOUSE OFFICER (Resident Surgical Officer), vacant June. Good general surgical experience. Recognised for F.R.C.S.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT HOUSE PHYSICIAN for above Hospital. Post vacant 29th June, 1957, and recognised for pre-registration purposes.

Applications, stating age, qualifications and experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 1st June, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. 2 OBSTETRIC HOUSE SURGEONS for above Hospital. Posts vacant 15th and 20th June, 1957, and recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications and experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 1st June, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. Locum JUNIOR HOSPITAL MEDICAL OFFICER required in the Casualty Department at above Hospital from 27th June to 14th July, 1957, inclusive.

Apply immediately to Medical Director (Tel.: EDGware 2381).

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (medicine), resident post, duties to commence beginning of July, 1957. Duties mainly general medical, experience in pædiatrics desirable. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to reach Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 31st May, 1957.

FARNBOROUGH HOSPITAL, Kent. (800 Beds.) House SURGEON required 28th June. Recognised for F.R.C.S. Pre-registration post.

Apply, stating age, qualifications with dates, and experience, and naming 3 referees, to Administrative Officer by 8th June.

GRIMSBY GROUP OF HOSPITALS. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 3rd June, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (108 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Post vacant 1st August, 1957. Duties include attendance at busy chest clinic at the Royal Halifax Infirmary and non-tuberculous chest ward work. This post offers excellent facilities for the study of chest diseases and experience is available with bronchoscopies and bronchograms. Salary £819 10s. p.a., with a deduction of £150 p.a. for board, residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Anæsthetics required. Post recognised for D.A. Salary £819 10s. p.a., less £150 p.a. for board, residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Casualty and Orthopædic Surgery required. Post recognised for F.R.C.S., and is vacant 1st July, 1957. Salary £819 10s. p.a., with deduction of £150 p.a. for board, residence, &c.

Apply to Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON for general surgery and orthopædics in this busy well-equipped hospital which is the principal surgical hospital in the Hastings Group. Recognised by Royal College of Surgeons. House Officer staff of 4.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to the Administrator of the Hospital.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty and orthopædics) in this busy, well-equipped General Hospital. House Officer staff of 4.

Applications, with copies of 2 recent testimonials, to the Hospital Administrator.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the undermentioned appointments :—

HOUSE SURGEON (general) first or second post. To commence 13th June, 1957.

HOUSE SURGEON (general, gynæcology and obstetrics) first or second post. To commence 13th June, 1957.

Pre-registration posts ; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 1st June, 1957.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident ANÆSTHETIST (Senior House Officer) required 1st July, 1957. Recognised for D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications, and experience, together with names of 2 referees, to the Medical Administrator, Lister Hospital, Hitchin, by 31st May, 1957.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds.) SENIOR HOUSE OFFICER (recognised for F.R.C.S.) vacant immediately. Duties of Resident Surgical Officer. Appointment for 1 year.

Applications together with 2 names and addresses for reference to the Administrative Officer.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Pædiatric Unit). Duties at Victoria Children's Hospital for 3 months, followed by 3 months on the pædiatric wards, Western General Hospital. An interesting and varied post which includes outpatient and casualty work. This appointment, which commences on 1st July, 1957, is recognised for the D.C.H.

Apply, giving experience, testimonials, &c., to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post, which is now vacant, is recognised for the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Hospital Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant mid-June. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) Resident SENIOR HOUSE OFFICER (medical) required at the above Hospital. This appointment provides for experience in the specialties of tuberculosis and geriatrics.

Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Resident Anæsthetist). The post, which becomes vacant on 1st July, 1957, and is normally of 1 years duration, is recognised for the D.A. and the F.F.A.R.C.S. examinations.

Applications, stating age and nationality, together with recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department, vacant on 23rd June, 1957. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the E.N.T. and Ophthalmic Departments, now vacant. The post is recognised for pre-registration and for the D.L.O. examination.

Applications, giving full particulars and copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE PHYSICIAN. Approved pre-registration post.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior HOUSE OFFICER (Maternity Department). Must have held medical, surgical, obstetrical and gynæcological house posts. Vacant 1st July, 1957.

Applications, stating age, nationality, qualifications with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 5th June.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (non-resident except on duty nights), vacant immediately. Possession of D.A. desirable. Recognised for F.F.A.R.C.S. The department comprises 3 teams and every kind of surgical work is carried out except thoracic and neuro surgery. Post includes work at neighbouring hospitals.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee. West Middlesex Hospital, Isleworth, by 4th June.

KETTERING. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at above Hospital. Post vacant now.

Applications, giving particulars of qualifications and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary, Kettering and District Hospital Management Committee, General Hospital, Kettering, immediately.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) HOUSE SURGEON for Obstetric and Gynæcology Departments. Applications from fully registered practitioners and pre-registration applicants. Post vacant 11th July, 1957. Recognised for D.Obst.R.C.O.G.

Apply Hospital Secretary, together with copy testimonials.

LUTON AND DUNSTABLE HOSPITAL. Children's ANNEXE, LUTON BEDS. RESIDENT PÆDIATRIC HOUSE OFFICER required mid-June. The post is recognised for the D.C.H. and as a second pre-registration post in medicine. The duties will cover both medical and surgical wards.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Halifax Group. Approximately 340 Beds in the surgical specialties. Resident.

Infectious Diseases

Leeds Road Hospital, Bradford. 160 infectious diseases beds. Resident.

General Medicine

Huddersfield Group (60 general medical beds). Non-resident.

General Surgery

Pontefract and Castleford Group (100 Beds). May include some duties in the Casualty Department. Married accommodation available.

General/Orthopædic Surgery

York A and Tadcaster Group. Resident or non-resident. Duties mainly at York County and City Hospitals. Aggregate of 110 general surgical and 70 orthopædic surgery beds. Duties divided between general and orthopædic surgery. May include some duties in the Casualty Department.

Orthopædic Surgery

(1) Pinderfields General Hospital, Wakefield (72 short-stay and 245 long-stay orthopædic beds), and at other hospitals in the Wakefield A and B Groups, recognised for F.R.C.S. May include some duties in the Casualty Department.

(2) St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds. Non-resident.

(3) Harrogate General Hospital (38 orthopædic beds). Non-resident.

Radiotherapy

Regional Radium Institute, Bradford (50 Beds), preferably resident. Unit provides a complete Radiotherapy service for approximately 1,000,000 population.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 30th May, 1957.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR in Thoracic Surgery. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Second year if possible at the General Infirmary at Leeds. Recognised for F.R.C.S.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 30th May, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR required for the Radiotherapy Centre. Candidates with D.M.R. preferred. The post will be tenable for 1 year in the first instance and renewable for a second. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, with 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, by Wednesday, 29th May, 1957.

LENNOXTOWN, STIRLINGSHIRE. LENNOX CASTLE MATERNITY HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at above Hospital. Salary in accordance with recognised scale and appointment subject to National Health Service (Superannuation) Regulations, 1950.

Applications, stating age, sex, nationality, qualifications, experience, and present appointment, together with names and addresses of 3 referees, to be submitted immediately to the Secretary, Board of Management, Lennox Castle, 113, Douglas-street, Glasgow, C.2.

LINCOLN. LAWN HOSPITAL, Union-road. (Mental Hospital for Private Patients—100 Beds.) LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (full-time) or LOCUM required. All modern treatments used at this active Hospital. Pleasant flat available.

Apply to the Medical Superintendent with copies of 3 testimonials.

LIVERPOOL, 13. RATHBONE HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER, vacant as from 1st August, 1957. Salary £819 10s., less £150 p.a. for resident charges. The Hospital has 144 Beds and admits the usual infectious diseases. Facilities might be given to the applicant appointed to attend the D.P.H. or similar course at Liverpool University.

Applications, on forms obtainable from the undersigned, to be returned completed not later than 8th June, 1957.

H. BLYTHE, Group Secretary.

Broadgreen Hospital, Liverpool, 14.

LIVERPOOL REGIONAL HOSPITAL BOARD. Liverpool RADIUM INSTITUTE. Applications are invited for the post of SENIOR REGISTRAR in Radiotherapy with duties at the above Hospital. Candidates must possess a Diploma in Radiology, and preference will be given to holders of a higher qualification.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 8th June, 1957.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for appointment as Locum REGISTRAR in Dermatology for the period from 23rd September to 14th December, 1957.

Apply by 17th June, 1957, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for appointments as SENIOR HOUSE OFFICERS in the following specialties for the period 1st October, 1957–30th September, 1958.

General Medicine.
Obstetrics and Gynæcology.
Orthopædics.
Ophthalmology.
Otorhinolaryngology.
Anæsthetics.
Pathology.
Radiology.
Pædiatrics (Cardiology).

Application forms giving a list of the various appointments may be obtained from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1, and should be returned by 11th June, 1957.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL ROYAL INFIRMARY. Applications are invited for the resident post of JUNIOR CASUALTY OFFICER (Senior House Officer grade) for the period 1st September, 1957–30th September, 1958.

Apply by 11th June on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of HOUSE SURGEON, vacant 30th June. Pre-registration post.

Applications, stating age, nationality and qualifications, with names of 3 referees, to Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant now. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MACCLESFIELD. PARKSIDE MENTAL HOSPITAL. (1650 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatric). Accommodation available for a single person. The appointment in the first place will be for a period of 4 years but re-application may be made by the successful applicant at the end of this period. Facilities for attending the course for the D.P.M. at Manchester University will be granted and the Hospital is recognised by the Conjoint Board for the purposes of the D.P.M. The Hospital may be visited by appointment.

Applications, with the names of 2 referees, to be sent to the Medical Superintendent, Parkside Hospital, Macclesfield, Cheshire, by 8th June, 1957.

MACCLESFIELD. PARKSIDE HOSPITAL MANAGEMENT COMMITTEE. (1650 Beds.) Applications are invited for the post of RESIDENT REGISTRAR in Psychiatry. Facilities for attending the course for the D.P.M. at Manchester University will be granted and the Hospital is recognised by the Conjoint Board for the purposes of the D.P.M. The Hospital may be visited by appointment.

Applications, with the names of 2 referees, to be sent to the Medical Superintendent, Parkside Hospital, Macclesfield, Cheshire, by 8th June, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD invites applications for the post of RESIDENT MEDICAL REGISTRAR to Macclesfield and District Group hospitals, main duties West Park Branch, Macclesfield Hospital. Furnished flat available for married candidates.

Apply immediately to Group Secretary, "Willerby House," Cumberland-street, Macclesfield, giving names of 2 referees.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the following posts :—

SENIOR HOUSE OFFICER.

HOUSE OFFICER (pre-registration surgical post).

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

Manchester Royal Eye Hospital.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant on 1st August, 1957. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn, in the Maternity Department, the care of infants in the infants' ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 3rd June, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for 2 posts of HOUSE OFFICER in Obstetrics, normally but not necessarily for provisionally registered medical practitioners. Salary in accordance with national scale. The appointments are for 6 months from 1st August, 1957.

Application forms may be obtained from the undersigned and returned not later than 3rd June, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of HOUSE OFFICER in Obstetrics for 6 months from 1st July, 1957. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 3rd June, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The post is recognised for the purpose of the M.R.C.O.G. examination. The appointment is for 6 months starting 1st August, 1957. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 3rd June, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (obstetrics) at the above Hospital. Post recognised for D.Obst.R.C.O.G.

Applications, with full details, to be submitted to the Administrative Officer immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties, vacant immediately. The post is recognised by the Royal College of Surgeons for the Final F.R.C.S. examination and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the Manchester University for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary, Withington Hospital, immediately.

MEXBOROUGH. MONTAGU HOSPITAL (165 Beds) AND SANDYGATE HOUSE ANNEXE. Locum SENIOR HOUSE OFFICER (casualty and orthopædics). Residential emoluments £150 p.a.

Applications to the Secretary, Hospital Management Committee, "Fern Bank," Doncaster-road, Rotherham.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIANS required during June.

Applications, stating age, qualifications and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration or registered HOUSE SURGEONS required : one 26th May, others June.

Applications, stating age, qualifications and nationality together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant immediately. Salary £819 10s. p.a., less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (811 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Post vacant 1st August. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 3rd June, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics and gynæcology) (recognised for pre-registration purposes) which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant on 15th July, 1957.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL Plastic Surgery, JAW INJURIES AND BURNS CENTRE. SENIOR HOUSE OFFICER in Plastic Surgery. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from Nottingham and Derby areas. Salary £819 10s., less £150 board-residence. Post vacant immediately.

Applications, together with copies of 3 testimonials, should be forwarded to the Hospital Secretary, Hucknall-road, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. SENIOR HOUSE OFFICER (surgical) required. Duties to commence on 24th June, 1957. Good opportunity for suitable candidate to gain experience in operating. This post is an excellent one for candidate who wishes to sit for Final F.R.C.S. examination in the near future.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Secretary.

NEWMARKET GENERAL HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN, vacant 8th June, 1957. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident and tenable for 6 months. Salary in accordance with national scale.

Applications, together with 3 recent testimonials, to Medical Superintendent.

NEWTON ABBOT HOSPITAL. (General Section 65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required 8th June, 1957. Married quarters available.

Applications (quoting Ref. F.364/38), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (resident) required 1st August, 1957, for 1 year in the first instance at the North Herts Hospital, Hitchin (where he will reside), and the Lister Hospital, Hitchin. Post recognised for F.R.C.S. The hospitals may be visited by direct appointment with the Medical Administrator, Lister Hospital.

Application forms obtainable from the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 12th June, 1957.

NEWCASTLE REGIONAL HOSPITAL BOARD.

REGISTRAR PSYCHIATRIST (whole-time), St. Mary's Hospital, Stannington, Morpeth (800 Beds). Accommodation for single person available. Married man may live out by arrangement, if near Hospital and prepared to sleep in when on duty.

REGISTRAR PSYCHIATRIST (whole-time), Winterton Hospital, Sedgefield (2000 Beds). Accommodation available.

The appointees will be able to take the Durham University D.P.M. Course. Further particulars from Regional Psychiatrist.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENTS OF OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the following posts, vacant on 7th July, 1957 :—

(1) **Newcastle General Hospital** (838 Beds)

Department of Obstetrics and Gynæcology (100 Beds), HOUSE SURGEONS (resident) pre-registration (2).

This department is recognised for the M.R.C.O.G., and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment.

(2) **Hexham General Hospital** (304 Beds)

Gynæcology : HOUSE SURGEON (resident), pre-registration. Recognised for M.R.C.O.G. Applications considered from final year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)

Obstetrics : HOUSE SURGEON (resident), pre-registration. Recognised for D.Obst.R.C.O.G.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, by 8th June, 1957.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The following resident posts become vacant on 7th July, 1957 :—

* HOUSE PHYSICIANS (4), General Medical Wards.
(2 of these posts rotate with the House Physician post in the Cardiovascular Department.)
* HOUSE PHYSICIAN (1), Cardiovascular Department.
(This post rotates with the 2 House Physician posts in General Medicine.)

HOUSE PHYSICIANS (4), Pædiatrics. Hospital for Sick Children, Newcastle upon Tyne (2), and Children's Department, Newcastle General Hospital (2).

3 of the posts are for pre-registration candidates (M. and S.). The posts offer experience in the whole of the pædiatric work of the hospitals, including general medicine and surgery and the special departments. There is a close association with the University Department of Child Health.

* HOUSE PHYSICIAN (1), Geriatric Unit.
* HOUSE SURGEONS (2), General Surgery. (Recognised for F.R.C.S. Diploma.)
* HOUSE SURGEON (1), Accident and Admission Department. (Recognised for F.R.C.S. Diploma.)

* These posts are recognised for the purpose of Pre-registration Service and applications will be accepted from students on the point of taking their qualifying examination.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, by 8th June, 1957.

ORPINGTON HOSPITAL, Orpington, Kent. Resident SENIOR HOUSE PHYSICIAN (Male or Female) for Geriatric Department. Post offers good clinical experience and opportunity for higher studies. Hospital may be visited by appointment.

Applications, with copies 2 recent testimonials, to Physician-Superintendent.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Pathology to Stoke Mandeville Hospital. This is a central clinical laboratory serving Stoke Mandeville and the Aylesbury hospitals and acting as parent to High Wycombe and Amersham laboratories. It is closely connected with research projects being undertaken at Stoke Mandeville Hospital. Appointment for 1 year in the first instance, eligible for extension for a second year. Applicants may visit Stoke Mandeville by arrangement with the Pathologist.

Application forms from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should be retruned to him by 12th June, 1957.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of NON-RESIDENT REGISTRAR in the Department of Pathology, Radcliffe Infirmary, to commence immediately. There will be opportunities for working in all the departments including neuropathology.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 8th June.

OXFORD. WARNEFORD AND PARK HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required. Warneford Hospital (150 Beds) is an acute Psychiatric Unit, specially related to research and postgraduate teaching. The adjacent Park Hospital is a Neurosis Centre (34 Beds) with daily outpatient clinics. Previous psychiatric experience not essential. This post is specially suitable for training for D.P.M., for which full facilities are available, including neurology and child psychiatry. The post is resident with accommodation for a single man or woman.

Further particulars may be obtained from the Physician-Superintendent, Warneford Hospital, Oxford, to whom application should be sent, with the names of 2 referees, by 8th June.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) SENIOR HOUSE OFFICER (obstetrics and gynæcology) to commence on 26th June, 1957.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd, as soon as possible.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Queen Alexandra Hospital (87 surgical beds)
HOUSE SURGEON (pre-registration), vacant end of June.

Infectious Diseases Hospital
SENIOR HOUSE OFFICER required with duties also on the tuberculosis wards and the poliomyelitis diagnostic and respiratory centre. Vacant now.

Chest Services of the Portsmouth Group
SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

Saint Mary's Hospital, Milton-road, Portsmouth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. AREA PATHOLOGICAL DEPARTMENT. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in Pathology, vacant May. The appointment will be for a period of 12 months in the Area Laboratory at the South Devon and East Cornwall Hospital, Greenbank Road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent to the undersigned as soon as possible.

F. HALL, Deputy Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Casualty, vacant 1st July, 1957. Recognised for the F.R.C.S. Central Casualty Department of the South Devon and East Cornwall Hospital, Freedom Fields, Plymouth.

HOUSE PHYSICIANS (pre-registration posts), vacancies (2) 1st July, 1957. Freedom Fields Section.

HOUSE SURGEON (pre-registration post), vacant 23rd July, 1957. Recognised for the F.R.C.S. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), vacancies 9th June, 1st and 5th July, 1957. Recognised for the F.R.C.S. Greenbank Road Section.

HOUSE SURGEON (pre-registration post), vacant 1st July, 1957. Recognised for the F.R.C.S. Devonport Section.

Applications, stating age, nationality, and experience, with names of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for E.N.T. Department, Royal Berkshire Hospital, Reading (40 Beds). Post recognised for D.L.O.

Applications, stating age, nationality, experience and qualifications, together with names of 2 referees, should be sent to Group Secretary, 3, Craven-road, Reading.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post, and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st June, 1957, for a period of 6 months. Successful candidates will be required to carry out duties at the following Reading Hospitals: Royal Berkshire Hospital (398 Beds), Battle (374 Beds), and Prospect Park (104 Beds).

Write immediately, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Accident and Orthopædic Department. Post vacant 2nd June, 1957. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners for the resident post of HOUSE SURGEON to the above Department. The appointment, which is vacant on 1st July, 1957, is for 1 year, with 6 months gynæcology at the Royal Berkshire Hospital, and 6 months in the Maternity Unit at Battle Hospital. Both appointments are recognised for the Diplomas of the Royal College of Obstetricians and Gynæcologists.

Write, stating age and qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (398 Beds.) Applications are invited from registered and provisionally registered medical practitioners, Male and Female, for resident post of HOUSE SURGEON, vacant 1st June, 1957, and tenable for 6 months.

Write immediately, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (339 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant from 1st May, 1957, for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £150 for board-residence.

Write, stating age, qualifications with dates, nationality and present post, together with the names of 3 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. HOUSE SURGEON. Appointment recognised for pre-registration training, fully-registered candidates may apply.

Applications to Hospital Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. SENIOR HOUSE OFFICER (Male), mainly surgical. Post vacant immediately.

Apply to the Hospital Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited for the appointment of a CASUALTY OFFICER (Senior House Officer grade) at the above Hospital. Post recognised for F.R.C.S. Successful applicant will be required to commence duties 1st July, 1957.

Applications, stating age, qualifications and experience and nationality, accompanied by copies of 2 recent testimonials, should be sent to the Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl, within 10 days of the date of publication of this advertisement.

RICHMOND. ST. JOHN OF GOD'S HOSPITAL, Scorton, RICHMOND, YORKSHIRE. Immediate vacancy for Male JUNIOR HOUSE MEDICAL OFFICER. Whitley scale.

Apply, Rev. PRIOR.

ROCHDALE INFIRMARY. Senior House Officer (anæsthetics) required.

Applications, with names and addresses of 2 referees and full particulars, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, as soon as possible.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (622 Beds.) Locum HOUSE PHYSICIAN required from 1st to 14th June, 1957.

Applications, &c., to be sent to the undersigned by 29th May, 1957. J. C. FIELD, Secretary.

ROMFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. CLINICAL ASSISTANT required on the staff of the Regional Ophthalmic Centre at Oldchurch Hospital, Romford, to undertake 1 outpatient session per week in the Eye Clinic at Connaught Hospital, Chingford (Wednesday afternoons).

Applications to be sent to Group Secretary, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required from 21st June, 1957. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit from 17th June, 1957. The service consists of 100 beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) required immediately in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) GYNÆCOLOGICAL HOUSE SURGEON (Male or Female), required. Unit comprises 35 gynæcological and 6 maternity beds. Resident post open to either pre-registration applicants or to fully qualified practitioners. Appointment includes certain relief duties on the medical side.

Applications to Medical Superintendent as soon as possible. Hospital may be seen by arrangement (Tel. Romford 7711).

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALFORD ROYAL HOSPITAL. Salford Hospital Management committee. Applications invited for the post of SENIOR HOUSE OFFICER in General Surgery (Assistant Resident Surgical Officer) vacant 20th July, 1957. This post is recognised for the F.R.C.S. and tenable for 1 year.

Applications, with names and addresses of 2 referees, to the Secretary, Salford Royal Hospital, Chapel-street, Salford, 3.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 1st July, 1957, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post is recognised for F.R.C.S. and is vacant 16th July, 1957.

Applications, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Paediatric House OFFICER required at Odstock Branch. 55 medical and surgical beds. Recognised for D.C.H. Vacant 25th July.

Applications, with names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of REGISTRAR to the E.N.T. Department. Post recognised for D.L.O. and F.R.C.S.

Application forms obtainable from, and returnable to, Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Medicine at the Royal Infirmary of Edinburgh, vacant on 8th August. The person appointed will be attached to the Professorial Unit and should have experience and interest in hæmatology.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 15th June, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Ophthalmology in the Royal Infirmary of Edinburgh.

Apply, giving particulars of age, qualifications, and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 15th June, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in the Regional Pool of Anæsthetists based on the Royal Infirmary of Edinburgh. The successful candidate will be seconded for periods of duty in peripheral hospitals, details of which may be obtained on application.

Apply, stating age, qualifications, and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 15th June, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in the Department of Psychological Medicine of the Royal Hospital for Sick Children, Edinburgh. During the tenure of the post opportunities for interchange of duty and training at other centres in the Region may be available under arrangements made between the South-Eastern Regional Hospital Board and the University Department of Psychological Medicine. Applicants must hold a Diploma in Psychological Medicine or a higher qualification in medicine. Previous experience in pædiatrics or psychiatry essential and preference will be given to candidates who have had experience in psychiatric work with children.

Apply, giving particulars of age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 15th June, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Radio-diagnosis at the Royal Infirmary of Edinburgh. The work will include periods of duty at other hospitals in the region.

Apply, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 15th June, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Anæsthetics based at the Southern General Hospital, Glasgow.

REGISTRAR in Surgery based at Broadstone Hospital, Port Glasgow. House available.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 8th June, 1957.

SHREWSBURY. CROSS HOUSES HOSPITAL. (34 maternity beds.) OBSTETRIC HOUSE SURGEON (pre-registration post), vacant mid-June, 1957.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. Children's unit. SENIOR HOUSE OFFICER or HOUSE OFFICER (pædiatric). Recognised D.C.H. The Unit consists of medical, surgical and fever beds. Vacant mid-July, 1957. Married quarters available.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

Royal Infirmary

(*a*) SENIOR HOUSE OFFICER in General Medicine. Post vacant 1st August, 1957. The successful candidate will work principally in the Professorial Unit (Therapeutics) at the Royal Infirmary.

Closing date for applications 5th June.

Royal Hospital

(*b*) NON-RESIDENT REGISTRAR to the Department of Neurology. Post vacant 16th July. This is a large Neurological Department in a Teaching Hospital Group. Post offers wide experience and opportunities for postgraduate training and for attending postgraduate teaching in other Departments.

Closing date for applications 5th June.

(*c*) NON-RESIDENT ORTHOPÆDIC REGISTRAR.

Applications to be sent at once.

REGISTRAR in Clinical Pathology. The successful candidate may be required to work in any of the laboratories of The United Sheffield Hospitals.

Closing date for applications 8th June, 1957.

Applications for the above posts should state age, qualifications and experience, give the names of 3 referees, and be sent to the following :—

For post (*a*) : Superintendent, Royal Infirmary, Infirmary-road, Sheffield, 6.

All other posts : The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. UNITED SHEFFIELD HOSPITALS BOARD OF GOVERNORS AND SHEFFIELD REGIONAL HOSPITAL BOARD. Reciprocal Training Scheme for Senior Registrars. 2 Whole-time SENIOR REGISTRARS in Radiology required. 1 with initial tenure of appointment at the City General Hospital, Sheffield, and the Barnsley Group of hospitals. 1 with initial tenure of appointment at the Leicester Royal Infirmary. Candidates should hold a Diploma in Diagnostic Radiology. Appointment for 1 year in first instance and renewable thereafter annually. The successful candidates will be transferred to the Teaching Hospitals for the second phase of the appointment, in accordance with arrangements under the Reciprocal Training Scheme. Renewal of appointment and transfer to the Teaching Hospitals will be subject to satisfactory work and progress.

Further details and form of application from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 13th June, 1957.

SHEFFIELD NATIONAL CENTRE FOR RADIOTHERAPY. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR HOUSE OFFICER or REGISTRAR in Radiotherapy required. (Possession of a higher qualification in medicine or surgery or the D.M.R.(T.) Part I would qualify for appointment of Registrar.) Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 3rd June, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD, S. CITY GENERAL HOSPITAL. Locum SENIOR HOUSE OFFICER (orthopædics) required for the period up to 14th July, 1957. Rate of pay £15 19s. per week.

Apply, giving full details, to the Group Secretary, Sheffield No. 1 Hospital Management Committee, Nether Edge Hospital, Sheffield, 11.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE SURGEON required (pre-registration post), 1 of 2.

Applications, with names of 2 referees, to Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR SURGICAL REGISTRAR required 14th–29th June.

Applications, with names of 2 referees, to Secretary.

SOUTHAMPTON CHEST HOSPITAL. South West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for Thoracic Surgical Unit at above Hospital. Previous experience in general surgery as a Registrar essential. Possession of F.R.C.S. would be desirable. The Unit consists of 80 surgical beds and has a very active Cardiac Department.

Application forms may be obtained from the undersigned to whom they should be returned not later than Wednesday, 5th June, 1957.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) RESIDENT HOUSE SURGEON required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON, ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND GENERAL HOSPITAL. Locum E.N.T. REGISTRAR required for the period 17th June–25th June, 1957.

Applications, stating qualifications, previous experience, &c., should be sent to the undersigned as soon as possible.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Applications are invited from registered or provisionally registered practitioners for appointment as RESIDENT HOUSE SURGEON. Post vacant 20th June, 1957.

Applications, stating age, qualifications, and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment) to reach the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA HOSPITAL MANAGEMENT COMMITTEE. LANCASTER HOUSE CHEST CLINIC AND CHEST UNIT, GENERAL HOSPITAL, ROCHFORD. Locum SENIOR MEDICAL REGISTRAR required from 3rd to 30th June, 1957, inclusive.

Applications to the undersigned as soon as possible.

J. C FIELD, Secretary.

SOUTHPORT PROMENADE HOSPITAL. (194 Beds.) SENIOR HOUSE OFFICER (Physician) resident. Post vacant June.

Apply, stating age, experience, qualifications, nationality, and enclosing copies of 2 recent testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHPORT GENERAL INFIRMARY. (Recognised for pre-registration.) HOUSE PHYSICIAN. Post vacant July.

Apply to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHPORT GENERAL INFIRMARY. (Recognised for F.R.C.S. and pre-registration.) HOUSE SURGEON (general surgery and ophthalmology). Post vacant July, 1957.

Apply, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHPORT GENERAL INFIRMARY. (Recognised for F.R.C.S. and pre-registration.) HOUSE SURGEON (general surgery and gynæcology). Post vacant July, 1957.

Apply, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics), Male or Female, resident. Recognised for D.A.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOCKPORT INFIRMARY. (163 Beds.) Locum Senior HOUSE OFFICER (medicine) required.

Applications, with full particulars and copies of 2 recent testimonials, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (531 Beds.) Applications are invited from candidates having had experience in obstetrics, for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology). This post is recognised for M.R.C.O.G., and is vacant 1st July, 1957. There are 72 obstetric and 40 gynæcological beds.

Applications, stating age, experience and qualifications, together with the names of 2 referees, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (531 Beds.) STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). The post is recognised for the D.A. and F.F.A.R.C.S. and there are facilities for study.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 General Surgical Teams. Post recognised for F.R.C.S. Post vacant 19th June and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens GYNÆCOLOGICAL AND OBSTETRIC REGISTRAR (resident) required immediately for about 6 weeks.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Whole-time JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for the gynæcological and obstetric wards. Post vacant about beginning of June, 1957.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS, HERTFORDSHIRE. HARPERBURY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. This is a modern hospital where 1729 mental defectives of all types and ages are under care. Approved for D.P.M. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hospital Management Committee, Harperbury Hospital, St. Albans, Herts.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER in the Senior House Officer grade at St. Helens Hospital (196 Beds). The post is approved for the 6 months training in casualty work required of candidates for the Fellowship of the Royal College of Surgeons.

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Group Secretary.

Whiston Hospital, Prescot.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (E.N.T.) required, vacant very shortly. Recognised F.R.C.S. and D.L.O.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (general medicine) with dermatology. Vacant early July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general medicine) with pædiatrics, vacant early July. Pre-registration post.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (orthopædics) required. Recognised pre-registration post. Hospital recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SUNDERLAND. THE ROYAL INFIRMARY. The CASUALTY DEPARTMENT. A vacancy will occur early July, 1957, for a CASUALTY OFFICER (Senior House Officer grade). The Casualty Officer is to take charge of the Casualty Department under the direct supervision of a Senior Surgeon. This post is recognised for the F.R.C.S.

Applications, with names of 2 referees, to the Hospital Secretary, Royal Infirmary, Sunderland.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, qualifications and experience, together with copies of 2 recent testimonials should be sent to the Medical Superintendent of the Hospital.

T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department of the above Hospital. The post is recognised for the F.R.C.S.(Eng.) and D.O. examinations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Hospital Secretary.

STOCKTON AND THORNABY HOSPITAL. Tees-side HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) at the above-named Hospital. The post is recognised for the F.R.C.S. examination and study time will be allowed. The Casualty Department is in charge of a Senior Casualty Officer.

Applications, stating full details and giving names of 2 referees, should be addressed to the Hospital Secretary, Stockton and Thornaby Hospital, Bowesfield-lane, Stockton-on-Tees.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 11th July (pre-registration post).

Applications, stating age, qualifications, with dates, with copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. RESIDENT SURGICAL REGISTRAR required.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 8th June.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant mid-June. The Department consists of the Area Maternity Unit of 45 Beds and a Gynæcological Unit of 25 Beds. Recognised for the M.R.C.O.G. The appointment is tenable for 1 year. Previous experience in obstetrics is essential.

Applications, stating age, qualifications, nationality, and experience, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (E.N.T.). Post vacant now. Post-registration appointment, recognised for F.R.C.S. and D.L.O.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (general surgery). Post vacant now. Recognised for pre-registration candidates, and F.R.C.S.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER (resident Surgical Officer) post. Vacant 1st June, 1957. This is a post giving excellent experience in surgery, including operating work according to qualifications and experience. The post is recognised by the Royal College of Surgeons as a qualifying appointment for the Final Fellowship examination.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, North SHIELDS. RESIDENT JUNIOR CASUALTY OFFICER for whole-time duty in Casualty Department which is under the direction of a Senior Casualty Officer. Junior Hospital Medical Officer or Senior House Officer grade according to experience. Post recognised under R.C.S. regulations.

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields.

VIRGINIA WATER, SURREY. HOLLOWAY SANA-TORIUM. Locum REGISTRAR (psychiatry) required for a period of provisionally 6 months.

Apply to Physician-Superintendent (Tel. : Wentworth 2241).

WALSALL HOSPITAL MANAGEMENT COMMITTEE. CLINICAL PATHOLOGIST (Junior Hospital Medical Officer grade), vacant 1st August. Full training in pathology and blood-transfusion.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. HOUSE SURGEON (general surgery, E.N.T. and ophthalmology) required. Approved pre-registration appointment, recognised for F.R.C.S. and D.L.O. Post vacant immediately. Salary and conditions of service in accordance with national recommendations.

Applications to Group Secretary, 113, Northgate, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited from fully registered HOUSE OFFICERS for appointment to :—

(*a*) The Orthopædic Surgery Department.

(*b*) The Thoracic Surgery Department.

£577 10s. p.a. Residential accommodation at charge of £125 p.a.

Address written applications, giving full particulars of experience, and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. SENIOR HOUSE OFFICER required for Orthopædic Surgery Department. Salary £819 10s. p.a., less £150 charge for accommodation.

Applications, giving full details and 2 names for reference, to W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WALLASEY, CHESHIRE. VICTORIA CENTRAL HOS-PITAL. Applications are invited for the post of CASUALTY OFFICER, which is approved by the Royal College of Surgeons of England as a training post for the Final examination of F.R.C.S. The Casualty Department is newly built and comprises minor operating theatre, plaster room, recovery rooms, examination rooms, dressings rooms, &c. The post may be resident or non-resident. Junior Hospital Medical Officer grade. Salary scale £852 10s.–£1182 10s. in accordance with M.D.B. Circular No. 29.

Applications, giving nationality, age, qualifications and experience, to the Group Secretary, North Wirral Hospital Management Committee, Victoria Central Hospital, Wallasey, immediately.

WATFORD. SHRODELLS HOSPITAL. (General Hos-pital—320 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Unit. This unit of 180 Beds, under full-time Geriatrician, offers excellent clinical experience in diagnosis and treatment of acute and other illnesses in the elderly. Full laboratory and radiological facilities available. Adequate time for reading.

Applications, together with copies of not more than 2 testimonials, to reach the Medical Officer-in-charge as soon as possible.

WELSH REGIONAL HOSPITAL BOARD. Surgical REGISTRAR (orthopædics) to serve Cardiff Hospital Management Committee. Based at Prince of Wales Hospital, Rhydlafar, near Cardiff (200–300 Beds). Hospital is Regional Orthopædic Centre for South Wales area. Married accommodation available. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. HALLAM HOSPITAL. Applications are invited from suitably qualified persons for the post of Part-time CLINICAL ASSISTANT in Obstetrics. 2 notional half-days weekly. Appointment to be subject to annual review.

Apply, Group Secretary, West Bromwich and District General Hospital, Edward-street, West Bromwich.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. BRIERLEY HILL HOSPITAL. (Long stay and Recovery Annexe—24 Beds.) Applications are invited from suitably qualified persons for the post of Part-time CLINICAL ASSISTANT to carry out 1 notional half-day per week at the above Hospital.

Applications to be submitted to Group Secretary, West Bromwich and District General Hospital, Edward-street, West Bromwich, from whom further details may be obtained.

WIGAN (near). BILLINGE HOSPITAL. Registrar in Psychiatry (resident or non-resident) to assist Consultant Psychiatrist. Main centre—Billinge Hospital. Active Psychiatric Unit. Modern treatment. Over 300 admissions annually. Post recognised for D.P.M. Good training facilities.

Applications, with names of 2 referees, to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery required, Male or Female, for post vacant 12th June. Recognised for F.R.C.S. Preference given to persons seeking a pre-registration post.

Applications, stating age, qualifications with dates, and nationality, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required. Senior House Officer grade. Department forms part of Accident Service of Windsor Group. Duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates, nationality, with copies of recent testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required, Male or Female, for post vacant 15th June. Preference given to persons seeking a pre-registration post.

Applications, stating age, qualifications with dates, nationality, and copies of 3 testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 13th July. Recognised for F.R.C.S. Pre-registration post.

Applications, stating age, qualifications with dates, nationality, and copies of recent testimonials, to Secretary.

WOKING. THE ROWLEY BRISTOW ORTHOPÆDIC HOSPITAL, PYRFORD, WOKING, SURREY. HOUSE SURGEON. Applications are invited from registered medical practitioners for this newly created post for 6 months appointment. Salary £577 10s. p.a., less £125 for board, lodging, &c.

Applications, with 2 names for reference, to be sent to the Secretary.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY. SENIOR HOUSE OFFICER required. 100 Beds and busy Outpatient Department. Recognised for F.R.C.S. and D.O. examinations.

Applications to Secretary as soon as possible.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICERS. Vacancies in Medicine occur on 12th June, 17th July and 21st July, 1957.

Apply, with copies of 2 testimonials, to Hospital Secretary.

WOLVERHAMPTON GROUP. The Royal Hospital. JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Experience in specialty not essential. Post vacant shortly. Candidates may visit Pathologist.

Applications to Group Secretary, The Royal Hospital, Wolverhampton, by 31st May, 1957.

WOODFORD BRIDGE, WOODFORD GREEN, ESSEX. CLAYBURY HOSPITAL (for nervous and mental disorders). Applications are invited for the post of Full-time SENIOR HOUSE OFFICER (resident or non-resident). Board-residence for an unmarried applicant, for which a charge of £150 p.a. will be made, is available. The Hospital has over 2000 Beds and an admission-rate of over 1300 a year. All forms of treatment are undertaken and outpatient clinics at general hospitals are run by the Hospital staff. Clinical conferences and seminars for the D.P.M. candidates are held weekly and facilities will be offered to attend lectures in London (1-hour journey). Previous general, but not psychiatric, experience necessary.

Application, with full particulars and the names and addresses of 2 referees, to be sent to the Physician-Superintendent not later than 14 days after the appearance of this advertisement.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of ANÆSTHETIC REGISTRAR in the above Group (Southlands Hospital, 411 Beds; Worthing Hospital, 210 Beds), vacant immediately. Post is recognised for the D.A. and F.F.A.R.C.S.

Forms of application are obtainable from the undersigned, and should be returned within 14 days from the appearance of this advertisement. A. V. OAKTON, Group Secretary,

Worthing Group Hospital Management Committee.

129, Brighton-road, Worthing.

YORK, COUNTY, CITY, MILITARY (CIVILIAN WING), FULFORD HOSPITALS. (General Hospitals of 266, 256, 60 and 149 Beds respectively with full Consultant staff.) SENIOR HOUSE OFFICER in Anæsthetics, resident or non-resident, required from 15th July, 1957. Recognised for F.F.A.R.C.S. and D.A. Previous experience desirable but not essential.

Applications, stating age, nationality, qualifications, experience, and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

ST. JOHN'S, NEWFOUNDLAND, CANADA. GENERAL HOSPITAL. (475 Beds.) Applications are invited for the following posts :—

RESIDENCY in Surgery.
RESIDENCY in Orthopædics.
RESIDENCY in Anæsthesia.

The above posts will be vacant on 1st July, 1957. Salary for each post $3200 p.a., less $480 p.a. for board, maintenance, &c.; full teaching programme. The Hospital is fully accredited by the Joint Commission on Hospital Accreditation and is recognised by the Royal College of Physicians and Surgeons of Canada for 1 years training towards certification. Applicant should have completed pre-registration year. Transportation to St. John's will be paid by the Hospital, and on completion of 1 years service, return passage will be provided.

Applications, with full details, to be forwarded to—

Dr. E. WILSON, Superintendent.

General Hospital, St. John's, Newfoundland, Canada.

U.S.A. CAMBRIDGE, MASSACHUSETTS. Applications are invited for the positions of RESIDENCIES in Anesthesia for a 2-year period beginning 1st July and 1st September, 1957. Salary $1800 first year and $3600 second year and full maintenance. Training in all branches of anesthesia. Affiliation with other hospitals.

Applications, stating age, nationality, qualifications, and experience, together with the names of their referees, should be forwarded to the Director of Anesthesiology, P.O. Box 89, Cambridge, Massachusetts. Travelling expenses to and from the U.S.A. will be paid. Particulars will be sent as soon as application is received. Please enclose recent photograph with application.

Public Appointments

LINCOLN. COUNTY OF LINCOLN—PARTS OF LINDSEY. ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Gainsborough Urban and Gainsborough and Isle of Axholme Rural Districts. Applications are invited from registered medical practitioners with experience in public health work and holding a Diploma in Public Health, Sanitary Science or State Medicine for the above whole-time mixed appointment. The salary which is in accordance with recommendations of the Medical Whitley Council Committee C as adopted by the County Council will commence at £1683 14s. 11d. p.a. and will rise by 3 annual increments of £58 15s. 0d., 1 of £61 17s. 6d., 4 of £34 7s. 6d., to a maximum of £2059 7s. 5d., and the officer appointed will be placed on the appropriate step of the scale having regard to his experience. The appointment will be subject to the Local Government Superannuation Acts, 1937 and 1953.

Forms of application and further particulars obtainable from the Clerk of the County Council, County Offices, Lincoln, to whom completed applications must be returned not later than 7th June, 1957. W. E. LANE,

Lincoln. Clerk of the Lindsey County Council.

BERWICK. COUNTY OF BERWICK. Applications are invited for the appointment of MEDICAL OFFICER OF HEALTH for the County of Berwick. Applicants must be duly qualified medical practitioners, and possess the Diploma in Public Health, or equivalent qualification. The salary is £1740–£55–£1960 p.a., with placing on scale according to experience. A car allowance is granted.

Copies of "Duties and Conditions of Appointment" may be had from the County Clerk, County Buildings, Duns, Berwickshire, with whom applications should be lodged, along with 8 copies each of 3 recent testimonials, not later than 29th June, 1957.

BERWICK. COUNTY OF BERWICK. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH. Applicants must be duly qualified medical practitioners, and the possession of the Diploma in Public Health, or an equivalent qualification, is desirable. The duties comprise general public health work, mainly in connection with school medical inspection and child welfare. The salary is £1050–£50–£1200–£55–£1475 p.a., with placing on scale according to experience. A car allowance is granted.

Copies of "duties and conditions of appointment," may be had from the County Clerk, County Buildings, Duns, Berwickshire, with whom applications should be lodged not later than 4th June, 1957.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICERS AND SCHOOL MEDICAL OFFICERS. Applications are invited from registered medical practitioners for whole-time superannuable posts. Salary £1050–£50–£1200–£55–£1475 p.a. Car allowance.

Particulars and forms of application are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, St. Mary's Gate, Derby, to whom they should be returned by 10th June, 1957.

DEPARTMENT OF HEALTH, NEW ZEALAND. Vacancy No. 939, VIROLOGIST, National Health Institute, Wellington. Minimum salary £1500, maximum £2300. Applications are invited for the above full-time appointment. Candidates should be registered medical practitioners with laboratory experience preferably in bacteriology and/or virology. Duties will comprise virus diagnostic work in particular the diagnosis of poliomyelitis by tissue culture methods and may include investigations of the epidemiology of this and other diseases in conjunction with Health Officers of the Department of Health.

Application forms, &c., obtainable on request from the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Please mention this paper and quote reference No. 10/195/66. Completed applications to be lodged in London not later than 28th June, 1957.

LEEDS EDUCATION COMMITTEE. Applications are invited from duly qualified medical practitioners, preferably Male, for appointment as SCHOOL MEDICAL OFFICER. Special consideration will be given to one experienced in refraction work. The officer appointed will work under the direction of the Principal School Medical Officer who is also Medical Officer of Health. He will be required to perform such other duties as the Council may from time to time determine. The salary scale is from £1050 to £1475 a year. Commencing salary determined in accordance with experience. The post is superannuable and the person appointed will be required to pass a medical examination. The officer will be restricted from engaging in private practice.

Forms of application may be obtained from the undersigned and must be returned within 21 days from the appearance of this advertisement. Canvassing in any form, either directly or indirectly, will be a disqualification.

GEORGE TAYLOR, Chief Education Officer.

Calverley-street, Leeds, 1.

MONMOUTHSHIRE COUNTY COUNCIL. The Council invite applications from duly qualified medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER. Experience in refraction work and possession of the D.P.H. or similar qualifications would be an advantage. The duties will mainly be the medical inspection and treatment of school children and infant welfare work. The salary will be at the rate of £1050 p.a. rising by annual increments of £50 to £1200 and then by £55 to a maximum of £1475. The successful candidate will be required to act under the direction of the County Medical Officer, to devote his/her whole time to the work of the County Council and to reside in such place as the County Council may determine. The post will be subject to the provision of the Local Government Superannuation Acts and Regulations, and to a satisfactory medical examination.

A schedule of duties to be performed, together with conditions of appointment and a form of application can be obtained from the County Medical Officer, to whom application, accompanied by copies of not more than 3 testimonials, are to be sent by 8th June, 1957. VERNON LAWRENCE, Clerk of the Council.

County Hall, Newport, Mon.

NAVY, ARMY AND AIR FORCE INSTITUTES. Applications are invited from general practitioners in the undernoted towns for the appointment in a part-time capacity as MEDICAL OFFICERS to this Corporation. Successful applicants would be required to examine and report on the condition of employees of the Corporation who may be referred to them from time to time. Fees for this work will be paid on a scale agreed with the British Medical Association.

Applications, giving full details of qualifications and experience, should be sent to Principal Medical Officer, Navy, Army and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 8th June.

The towns for which applications are invited are :—

KIDDERMINSTER	STRATFORD-ON-AVON
BIRMINGHAM	SHREWSBURY
WREXHAM	BLACKPOOL
LANCASTER	

TORQUAY. BOROUGH OF TORQUAY AND COUNTY OF DEVON. MEDICAL OFFICER OF HEALTH/ASSISTANT COUNTY MEDICAL OFFICER. Applications are invited for the mixed appointment of Medical Officer of Health to the Borough of Torquay and Assistant County Medical Officer to the Devon County Council. Apportionment of Service—80% to the Borough Council and 20% to the Devon County Council. Salary £1734 10s.–£2016 15s. D.P.H. or equivalent essential. Diploma in Child Health and Certificate for the Ascertainment of E.S.N. Children desirable.

Particulars and application forms, returnable by 12th June, 1957, from the County Medical Officer, 45, St. David's-hill, Exeter.

UGANDA PROTECTORATE. **Resident Medical Officers** required at Nakasero (European and Asian) Hospital, Kampala, to work under direction of a Specialist Surgeon, Physician or Obstetrician. Candidates must have medical qualification registrable in United Kingdom and 1 year registrable status. Appointment on contract (for 1 year in first instance) with gratuity (taxable) and salary £1503–£2115 a year. Arrangements may be made at some future date for officers to be appointed to permanent and pensionable posts as Medical Officers in Medical Department.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/9/016).

THE REPUBLIC OF THE SUDAN. **The Ministry of** Health requires the services of an ANÆSTHETIST. Candidates must be registered practitioners with specialist experience in anæsthetics. A Diploma in Anæsthetics is preferred. Age 30–45. Appointment will be on a short-term contract for a period up to 5 years. Salary range £S.1075–£S.2210 p.a. Point of entry is determined according to age, qualifications and experience. A cost-of-living allowance is payable, and an outfit allowance of £S.50 on appointment. Annual leave of 84 days is granted. For candidates resident in England, superannuation under the terms of Ministry of Health circular RHB/51/1, H.M.C.(51)1, B.G.(51)1 and secondment under the terms of circular RHB/52/106, B.G.(52)101 are applicable to the Sudan.

Full details and application forms are obtainable from Dr. E. P. PRATT, 137, Harley-street, London, W.1. Closing date 15th June, 1957.

THE REPUBLIC OF THE SUDAN. **The Ministry of** Health invite applications for the post of SURGICAL SPECIALIST. Candidates must possess the necessary professional qualifications—viz., F.R.C.S. or its internationally recognised equivalent. Age between 28 and 48. Salary range £S.1750–£S.2210 for Junior Specialists or a flat of £S.2210 for Specialists. Candidates, resident in England, for this post may apply for secondment from the National Health Service for a period of up to 3 years under the terms of the circular letter no. RHB(52)106, B.G.(52)101 of 30th September, 1952. The appointment will be on a short-term contract for a period of up to 5 years. Starting salary will be determined according to age and qualifications. A bonus of 1 months salary for each completed year of service will be payable and an outfit allowance of £S.50 on signature of contract.

Further particulars and application form can be had from Dr. E. P. PRATT, 137, Harley-street, London, W.1. Closing date 15th June, 1957.

WARWICKSHIRE COUNTY COUNCIL. **County Medical** OFFICER OF HEALTH'S DEPARTMENT. Applications are invited from registered medical practitioners for the permanent appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH (Male). Preference will be given to those holding the D.P.H. or D.C.H. and with previous experience. Conditions of service and salary (£1050–£1475) will be in accordance with the Whitley Council. The successful candidate will be required to provide a motor-car in the performance of duties, for which Whitley Council scale allowances are payable.

Further particulars, including details of area and duties, and application forms may be obtained from the County Medical Officer of Health, Shire Hall, Warwick. Closing date for applications is 22nd June, 1957.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 16th May, 1957.

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

HEBDEN BRIDGE, YORKSHIRE. **Applications are** invited for death VACANCY (urban and rural). List at present approximately 2000. Apply on Form E.C.16A to the undersigned, from whom further particulars may be obtained not later than 3rd June, 1957.

C. H. STABLER, Clerk of the West Riding Executive Council.
5, St. John's-north, Wakefield.

Hospital Services : Non-Medical Appointments

PRINCE OF WALES'S GENERAL HOSPITAL, The Green, N.15. NON-MEDICAL BIOCHEMIST (Principal grade) required. Whitley Council salary scale and conditions of service. Inquiries regarding scope of duties to be addressed to the Group Pathologist.

Applications, stating age, qualifications, and experience, and the names of 2 referees, to the Group Secretary.

ST. MARY'S HOSPITAL, Paddington, W.2. **Applications** are invited for the post of BIOCHEMIST. Candidates should hold an honours degree in Chemistry or Biochemistry, or be an A.R.I.C. or hold equivalent qualifications, and should have had at least 3 years experience in clinical biochemistry or in a closely related field. Whitley Council salary and conditions of service.

Applications, giving details of age, qualifications and experience, with the names of 3 referees, should be sent to ALAN POWDITCH, House Governor, by 4th June, 1957.

Miscellaneous

Medical and General Nursing-home (no surgery), Sussex Coast. Licensed. 14 patients. Attractive detached property close sea and centre of town. Audited accounts show net profit of £1200 p.a. Mostly permanent type of patient. Nice home for owner. Garden. Garage. Lease 15 years. Rent £275 p.a. Price £3000 inclusive. Part might remain. Marriage sole reason for sale.—HAMMERSLEY, KENNEDY & CO., 19, Hanover-square, London, W.1.

British Overseas Airways Corporation. **Applications are** invited for the post of Research Medical Officer in the Corporation's Medical Service. Applicants should be between 30 and 35 years of age, well qualified academically and should possess a high standard of practical and theoretical knowledge of aviation medicine and physiology. Experience as a qualified pilot and the medical care of aircrew will be an advantage. The successful applicant will be based at London Airport and the work will include all aspects of aero medical engineering research as applicable to the Corporation's aircraft and flying staff, and will involve flying at home and overseas. The Research Medical Officer will work in close liaison with the Corporation's Flight Operations and Engineering Departments. Commencing salary will be in the range £2125–£2500 p.a. according to age, qualifications and experience. The successful candidate will be required to join the Corporation's Pension Scheme.

Applications should be made, together with details of professional qualifications and experience to the Chief Personnel Officer, B.O.A.C. Headquarters, London Airport, Hounslow, Middx. The closing date for receipt of applications will be 14th June, 1957.

Cameroons Development Corporation require for service in the British Administered Territories of the Southern Cameroons a Medical Officer. Candidates should have a good experience of general medical and health work and preference will be given to those who either possess a Diploma in Tropical Medicine or who have had tropical experience. The work generally consists of general medical and health supervision of all personnel in large plantations, but offers opportunity for surgery. Commencing salary in a scale £1525, rising to £1975. Free return passages are provided for Officers and their wives, together with free quarters and heavy furniture during residence in the Cameroons. A reasonable amount of free lighting and fuel is also provided, and necessary transport. An outfit allowance of £80 is payable on first appointment. Children's allowances at the rate of £75 each are payable up to a maximum of 2. Officers are required to contribute 10% of their salary to a Provident Fund to which the Corporation contributes a further 15%. Tours of about 18 months, with 1 weeks leave for each month of service before returning for further duty.

Applications, giving particulars in writing, to RUBBER & MINING AGENCIES LTD. (CDC/MO), 52, Leadenhall-street, London, E.C.3. Acknowledgment will only be made to those applications selected for further consideration.

Assistant Medical Officer, resident, required for old established private mental hospital in the South East. Previous psychiatric experience not essential. House available. Total emoluments worth £1100 p.a.—Address, No. 292, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Assistant, no view. **Married quarters gratis.** **Industrial** Birmingham. Must own car. Proportion midwifery, yielding approximately £1200 gross.—Address, No. 298, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Nurse-receptionist required for holiday duty for doctor's surgery in Westminster. 17th June–6th July.—Address, No. 297, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Harley-street. **Large consulting-room immediately avail-** able. 3 large windows, very quiet, divisible if preferred. Second floor, no lift, usual offices.—Address, No. 296, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Harley-street. **Corner residence suitable for Doctor or** Dentist. 15 rooms, 2 bath-rooms and basement. Lease for disposal with vacant possession of whole if required or with benefit of existing sub-tenancies.—Apply : DEACON & ALLEN LTD., 37, Connaught-street, W.2 (AMB. 1066).

Bath Spa. **Exclusive residential Nursing-home.** **Central** overlooking Park. Registered for 23 patients. Fully furnished, equipped as a going concern. Turnover £18,516. Audited accounts.—COWARD, JAMES & MORRIS, 14, New Bond-street, Bath.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Microscopes. **Highest prices paid for good modern types.** Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Typewriting and Duplicating. **First-class work at moder-** ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Hypnotism. **Will all doctors interested in this subject** for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley-street, W.1.

German doctor offers a holiday in Bad Nauheim (health- resort spa for cardiac disorders) for 5 children or adults from 19th July to 26th August in exchange for 5 girls aged 12–18 spending a holiday for the same period in England, preferably at the seaside.—Dr. med. LUFT, Bad Nauheim/Germany, Karlstrasse 27.

Doctor requires resident working cook-housekeeper, South Essex. Daily help. Please state previous experience and wages required.—Address, No. 299, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, May 25, 1957.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

SELF-SUFFICIENT

On the solid foundation of consistently superior results, ACHROMYCIN tetracycline has won unqualified acceptance among doctors and hospitals throughout the world. So broad is its spectrum . . . so intensive its antimicrobial activity, that this is truly the *self-sufficient* antibiotic, needing no further support in establishing its mastery over an impressive range of infections.

ACHROMYCIN*

*REGD. TRADE MARK TETRACYCLINE

THE SELF-SUFFICIENT ANTIBIOTIC

Capsules · Ear Solution · Intramuscular · Intravenous · Ointment 3% · Ointment (Ophthalmic) · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops · SPERSOIDS* Dispersible Powder · Soluble Tablets · Syrup · Tablets · Troches

LEDERLE LABORATORIES DIVISION Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

Lederle

Hay Fever

The use of a nasal decongestant for symptomatic relief in hay-fever is well established in clinical practice. For this purpose the preparation which meets all the basic requirements of the ideal nasal decongestant is . . .

Fenox
nasal drops

Isotonic Nasal Drops of Phenylephrine and Naphazoline.
Basic N.H.S. price 1/8 per ½ fl. oz. dropper bottle.

Detailed literature gladly sent on request

BOOTS PURE DRUG COMPANY LIMITED, NOTTINGHAM, ENGLAND

Boots

8273